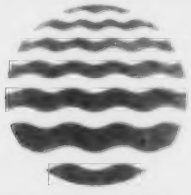
STOPPING WATER POLLUTION AT ITS SOURCE



MISA

Municipal/Industrial Strategy for Abatement

ACUTE LETHALITY DATA FOR ONTARIO'S PULP AND PAPER SECTOR EFFLUENTS COVERING THE PERIOD FROM JULY 1990 TO DECEMBER 1990

Ontario

Environment
Environnement

ISBN 0-7729-8927-3

ACUTE LETHALITY DATA FOR ONTARIO'S PULP AND PAPER SECTOR EFFLUENTS COVERING THE PERIOD FROM JULY 1990 TO DECEMBER 1990

Report Prepared By:

Aquatic Toxicity Unit
Water Resources Branch
Ontario Ministry of the Environment

MARCH 1992

Cette publication technique
n'est disponible qu'en anglais.

Copyright: Queen's Printer for Ontario, 1992
This publication may be reproduced for non-commercial purposes
with appropriate attribution.

PIBS 1830
log 91-2345-076

ACUTE LETHALITY DATA FOR ONTARIO'S PULP AND PAPER SECTOR EFFLUENTS COVERING THE PERIOD FROM JULY 1990 TO DECEMBER 1990

Report Prepared By:

S.G. Abernethy, J.T. Lee, C.S. Logan, M.C. Mueller
D.G. Poirier and G.F. Westlake

Aquatic Toxicity Unit
Water Resources Branch
Ontario Ministry of the Environment

CONTENTS

	Page
SUMMARY	i
Abitibi-Price Inc., Iroquois Falls Division, Iroquois Falls	1
Abitibi-Price Inc., Provincial Papers Division, Thunder Bay	5
Abitibi-Price Inc., Fort William Division, Thunder Bay	7
Abitibi-Price Inc., Thunder Bay Division, Thunder Bay	11
Beaver Wood Fibre Co. Ltd., Thorold	13
Boise Cascade Canada Ltd., Fort Frances	17
Boise Cascade Canada Ltd., Kenora	22
Canadian Pacific Forest Products Ltd., Dryden	24
Canadian Pacific Forest Products Ltd., Thunder Bay	26
Domtar Inc., Fine Papers Division, Cornwall	30
Domtar Inc., Containerboard Division, Red Rock	32
Domtar Inc., Fine Papers Division, St. Catharines	34
Domtar Inc., Containerboard Division, Trenton	36
E.B. Eddy Forest Products Ltd., Ottawa	38
E.B. Eddy Forest Products Ltd., Espanola	40
James River-Marathon Ltd., Marathon	43
Kimberly-Clark Canada Ltd., Huntsville	48
Kimberly-Clark Canada Ltd., St. Catharines	50
Kimberly-Clark Canada Ltd., Terrace Bay	52
MacMillan Bloedel Ltd., Sturgeon Falls	56
Malette Kraft Pulp and Power Co., Smooth Rock Falls	58
Noranda Forest Inc., Recycled Papers, Thorold	62
Quebec and Ontario Paper Co. Ltd., Thorold	64
Strathcona Paper Co., Napanee	66
Spruce Falls Power and Paper Co. Ltd., Kapuskasing	71
St. Mary's Paper Inc., Sault Ste. Marie	73
Trent Valley, Paperboard Industries Corp., Trenton	75

SUMMARY

Under the MISA program, the Pulp and Paper Sector was required to conduct laboratory toxicity tests to monitor its wastewater discharges for acute lethality to rainbow trout and to *Daphnia magna*. This requirement was based on the Ontario Environmental Protection Act which allows the Ministry to write regulations requesting persons responsible for sources of contaminants to monitor, record and report to the Ministry. The requirements for toxicity testing are identified in the General Effluent Monitoring Regulation (Ontario Regulation 695/88) and in the Effluent Monitoring Regulation For The Pulp And Paper Sector (Ontario Regulation 435/89). Some additional information is identified in, "The Development Document For The Effluent Monitoring Regulation For The Pulp And Paper Sector" (Env. Ont. 1989). The monitoring data will be used, in part, to develop effluent limits for acute toxicity. This report is a compilation of the toxicity data for samples collected in the second six months of the program, and for audit samples tested at the Ministry's laboratory in Rexdale.

The regulatory toxicity tests were conducted following standard procedures (Protocol To Determine The Acute Lethality Of Liquid Effluents To Fish. Env. Ont. July 1983 and *Daphnia magna* Acute Lethality Toxicity Test Protocol. Env. Ont. April 1988). In these tests, the organisms are exposed to undiluted effluent and several effluent dilutions for a fixed period. A trout test is a 96 hour exposure, and a *Daphnia* test is a 48 hour exposure. The number of organisms that die is the toxic effect that is recorded. The quantitative measure of toxicity is the median lethal concentration (LC50). It is the concentration of effluent estimated to cause mortality to 50 % of the test organisms.

The collection of samples for toxicity testing coincided with the collection of samples for chemical characterization, also required under this regulation. The frequency of sampling for toxicity testing was monthly, except if three consecutive trout tests had no more than 50 % mortality at any concentration, then a sampling frequency of once every three months (quarterly) was permitted for further trout tests. For cooling waters, single concentration tests of undiluted effluent were permitted for quarterly samples only.

The monitoring occurred at 41 sampling locations at 27 mills. For the period of July to December 1990, the Ministry accepted the results of 173 trout and 209 *Daphnia* tests. For trout: 65 samples were nonlethal, 24 samples were LC50 > 100 % effluent and 84 samples were lethal (LC50 < 100 % effluent). For *Daphnia*: 93 samples were nonlethal, 33 samples were LC50 > 100 % effluent and 83 samples were lethal. Figures 1 to 16, following the Summary, are graphs of the data (LC50s and 95 % confidence limits) for selected discharge points.

The Aquatic Toxicity Unit of Environment Ontario tested 17 "audit" samples over the

monitoring period, and found that the results of audits were generally consistent with the results submitted by the companies. The differences that were observed between the results can be explained primarily by temporal changes in effluent quality; the audits were not tests of split samples, and different samples had different compositions.

A preliminary interpretation of the toxicity results is given below concerning the possible causes of acute lethality. The Toxicity Test Reports and the data from the chemical characterizations were used for this purpose.

COOLING WATER. 27 of 33 samples were nonlethal to trout, 4 samples were LC50 > 100 % effluent and 2 samples were lethal. 36 of 54 samples were nonlethal to *Daphnia*, 11 were LC50 > 100 % effluent and 7 were lethal. Residual chlorine, from the municipal water supply to the mill, was the probable cause of toxicity to *Daphnia* of two samples from Kimberly-Clark, Terrace Bay. Two samples of Spill P-2 at Beaver Wood, Thorold were toxic. This mill, as a proactive abatement action, has lowered the level of their spill pond to prevent discharge. Four cooling water samples from Strathcona Paper Company, Napanee were toxic.

SULPHATE (KRAFT) MILLS. Effluent samples of low pH from James River-Marathon in the summer and samples of extreme pH from Malette in the winter were associated with low LC50s for both test species. The samples of Combined Mill Outfall at Canadian Pacific, Thunder Bay were more toxic to trout than to *Daphnia*. The samples from Domtar, Red Rock were toxic to trout, and the LC50s were relatively constant (68 to 84 % effluent); resin acid concentrations were close to lethal levels in the chemistry samples of this effluent. The samples of Clean Water Outfall at Canadian Pacific, Thunder Bay were toxic to *Daphnia*, and residual chlorine was the suspected cause. Even though Boise Cascade, Fort Frances has secondary treatment, some of the effluent samples were still toxic to trout. The effluent samples from E.B. Eddy, Espanola, Canadian Pacific, Dryden and Kimberly-Clark, Terrace Bay were usually nonlethal or LC50 > 100 % effluent. These mills have secondary treatment systems.

SULPHITE-MECHANICAL MILLS. Most of these samples were toxic to both animals and trout was usually more sensitive than *Daphnia*, based on a comparison of the LC50s for the same sample. This difference between species was often insignificant, based on a comparison of the 95 % confidence limits of the LC50s (for example, the samples from Abitibi-Price, Thunder Bay). The LC50s were low for the samples from Abitibi-Price, Iroquois Falls, Abitibi-Price, Fort William and Boise Cascade, Kenora. For Boise Cascade, Kenora, the trout LC50s were relatively constant, while *Daphnia* LC50s were lower in the winter than in the summer. Resin acids (typically 1 to 10 mg/L, but as high as 23 mg/L) occurred frequently in the toxic samples from this mill category. The biological uptake of resin acids is highest under acidic conditions, and pH itself may be toxic when it is outside the range 5.5 to 9.5. Most of the effluent

samples of low pH were from Abitibi-Price (Thunder Bay and Iroquois Falls) and from Boise Cascade, Kenora. The effluent samples from Spruce Falls in November and December had low LC50s, probably due to low pH and high resin acid concentrations. Low concentrations of dissolved oxygen (DO) may have contributed to the *Daphnia* toxicity of the samples from three mills of Abitibi-Price (Iroquois Falls, Fort William and Thunder Bay) and from St. Mary's. The effluents of Abitibi-Price, Provincial Papers and Quebec and Ontario Paper were generally nonlethal. The latter mill has a secondary treatment system and a program for waste reuse and recycling.

CORRUGATING MILLS. Effluent samples from Domtar, Trenton were toxic to both animals and trout was more sensitive. Resin acids were implicated as the primary toxicants.

DEINKING-BOARD-FINE PAPERS-TISSUE MILLS. These effluents were the least toxic to both animals. The best examples were the mills of Kimberly-Clark (St. Catharines and Huntsville). The latter mill has a small seasonal discharge, due to its effective procedures for wastewater recycling and treatment. Strathcona Paper Company, Napanee has secondary treatment and only one effluent sample was toxic to trout. The toxic samples in this mill category were from Noranda Forest, Thorold. Residual chlorine was the likely cause and the samples had a wide range of LC50s for *Daphnia* (0.7 to 29.5 % effluent). Noranda Forest has since installed a dechlorination system, as a proactive abatement action to reduce toxicity. *Daphnia* was more sensitive than trout to the samples from E.B Eddy, Ottawa, and suspended solids (clay) may have been responsible. Three samples from Beaver Wood, Thorold were slightly toxic to *Daphnia*, and low DO levels may have been the cause.

Overall, the data suggest that resin acids and pH extremes were the primary causes of acute lethal toxicity in the samples of pulp and paper effluent. The impact of pH cannot be separated from that of the other toxicants because it has a direct toxic action and a modifying effect on the physical, chemical and toxic properties of other effluent constituents. The interpretation of the toxicity data from the chemical characterization was difficult because the samples contained many substances.

While *Daphnia* tended to be less sensitive than trout, there were many samples that showed no difference in toxicity or that were more toxic to *Daphnia*. For 92 samples, an LC50 was measured for at least one of the two species. Trout was more sensitive to 33 of these samples, *Daphnia* was more sensitive to 24 samples and there was no difference in species sensitivity to 35 samples. The samples from St. Mary's exemplify this variability in toxicity to the two species. Since *Daphnia* is a filter-feeder, it may respond additionally to the suspended solids in these effluents. There was some evidence that low DO levels (high BOD) were a toxic factor in *Daphnia* tests. The toxicity database for the pulp and paper sector shows that tests of both species are needed to better assess and control the potential impact of these complex and variable effluents on the aquatic environment.

The most toxic effluent samples were from the mills in the Sulphate (Kraft), Sulphite-Mechanical and Corrugating categories that did not have secondary treatment of all effluents. The least toxic and nonlethal samples were generally from the Deinking-Board-Fine Papers-Tissue mills and from the mills that have secondary treatment systems. There were exceptions, as noted above. Further generalizations, relating facility process operations and treatment technologies to the toxicity of process effluents, are difficult to make because effluent toxicity will be influenced by other factors such as chemical spills, overloading, differences in wood furnish and the daily operation and maintenance of "ex-plant" treatment systems. Also, some of the results may reflect seasonal differences or process changes over the six month period of sampling. A more detailed analysis of all the available data for the whole year of monitoring (toxicity, chemistry and facility operations) is necessary before the cause(s) of toxicity can be confirmed with any assurance for a specific effluent.

The toxicity tests will detect harmful concentrations and mixtures of most constituents of effluents. But compliance with end-of-pipe limits for acute toxicity would not necessarily control the potential effects of environmental contamination that can be caused by the loading of bioaccumulative substances. These substances are generally nonpolar organic chemicals of high molecular weight and low water solubility. A specific assessment of this hazard is difficult because of the large number of organic substances in these effluents. Hydrophobic substances would be mostly sorbed to the suspended solids in the effluents, rather than in aqueous solution. The implication is that control of the suspended solids could, as a side benefit, also control the bioaccumulative substances.

The MISA toxicity database is generally complete, except for four *Daphnia* tests that were not accepted because they were invalid. These were the tests for control points 100 and 700 in November at Boise Cascade, Fort Frances, and for control point 100 in September and November at Canadian Pacific, Dryden. These companies are performing additional, compensatory monitoring at their mills because of invalid data. Due to mill labour disputes during the monitoring period, no data were available for the tests in September at three mills of Abitibi-Price (Iroquois Falls, Provincial Papers, Fort William), in November and December at Canadian Pacific, Thunder Bay and in August to November at Quebec and Ontario Paper, Thorold. An inspection was conducted on the testing laboratory for MacMillan Bloedel Inc., Sturgeon Falls. This inspection was conducted in response to several problems encountered with the toxicity data received by the Ministry on behalf of the company. The inspection revealed several problems at the testing laboratory, therefore, the data submitted for their client have been removed from the database.

The body of this report, following the figures, presents the summaries of the acute lethality data, grouped by company. These summary pages are part of the complete database, that includes the Toxicity Test Report submitted by industry for each test sample. The complete database is available from the Water Resources Branch,

Toronto, upon request. The comment fields on individual Toxicity Test Reports were entered by the industry's laboratory performing the tests, and should not be expected to be consistent across samples and do not necessarily represent the views of the Ministry.

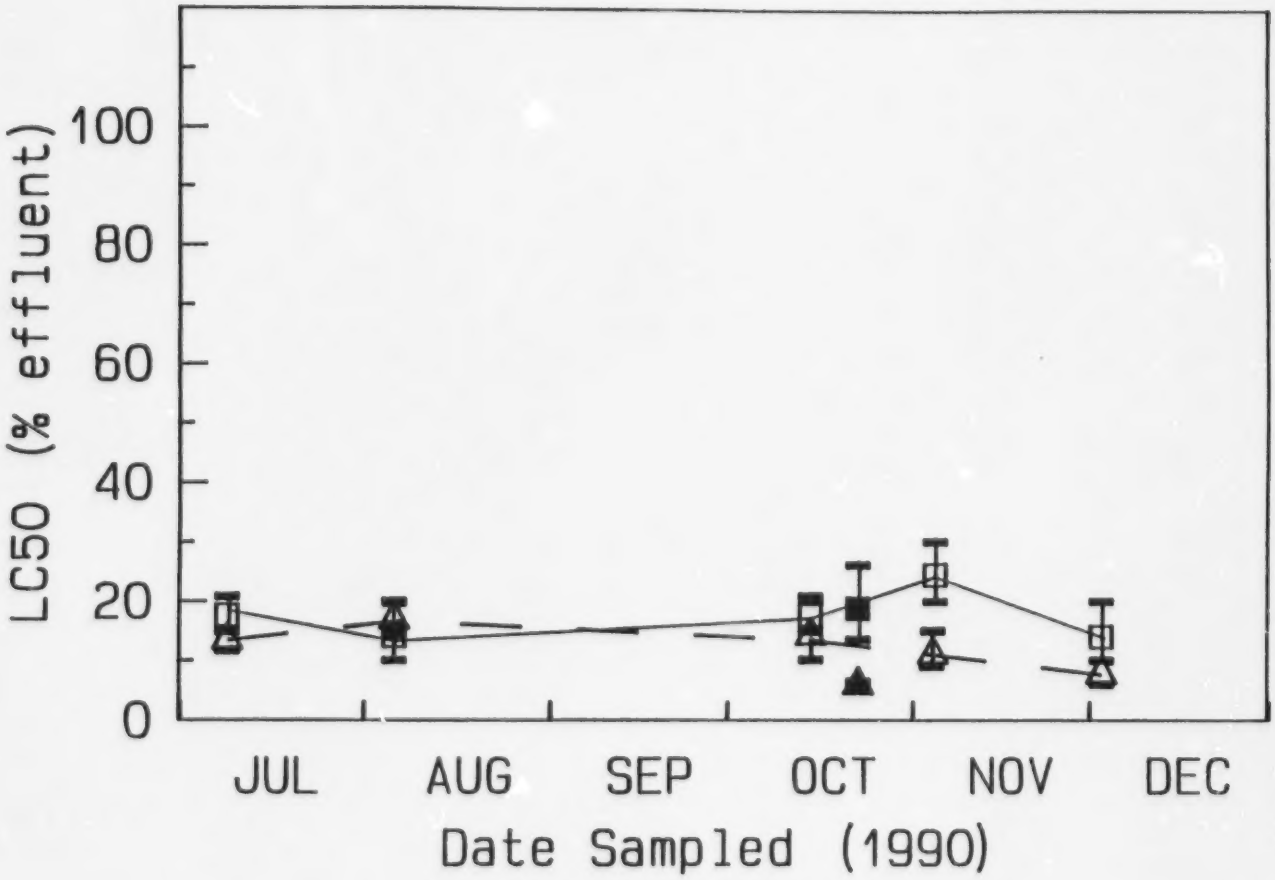


Figure 1. The toxicity of effluent samples from Abitibi-Price Inc., Iroquois Falls Division, Iroquois Falls, Total Outfall. (Δ Trout, □ *Daphnia magna*). Solid symbols are audit samples.

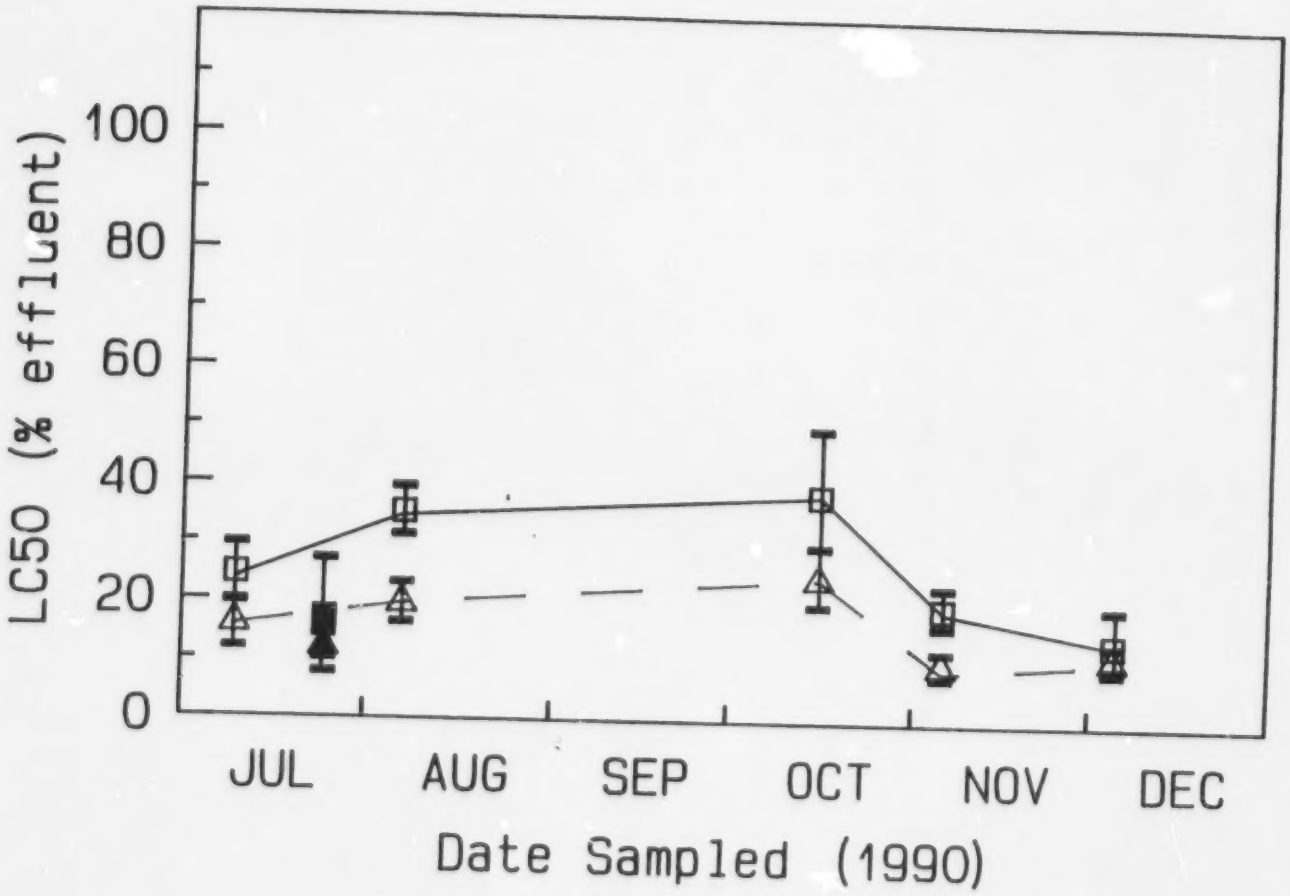


Figure 2. The toxicity of effluent samples from Abitibi-Price Inc., Fort William Division, Thunder Bay, Main Sewer Lagoon # 1. (Δ Trout, □ *Daphnia magna*). Solid symbols are audit samples.

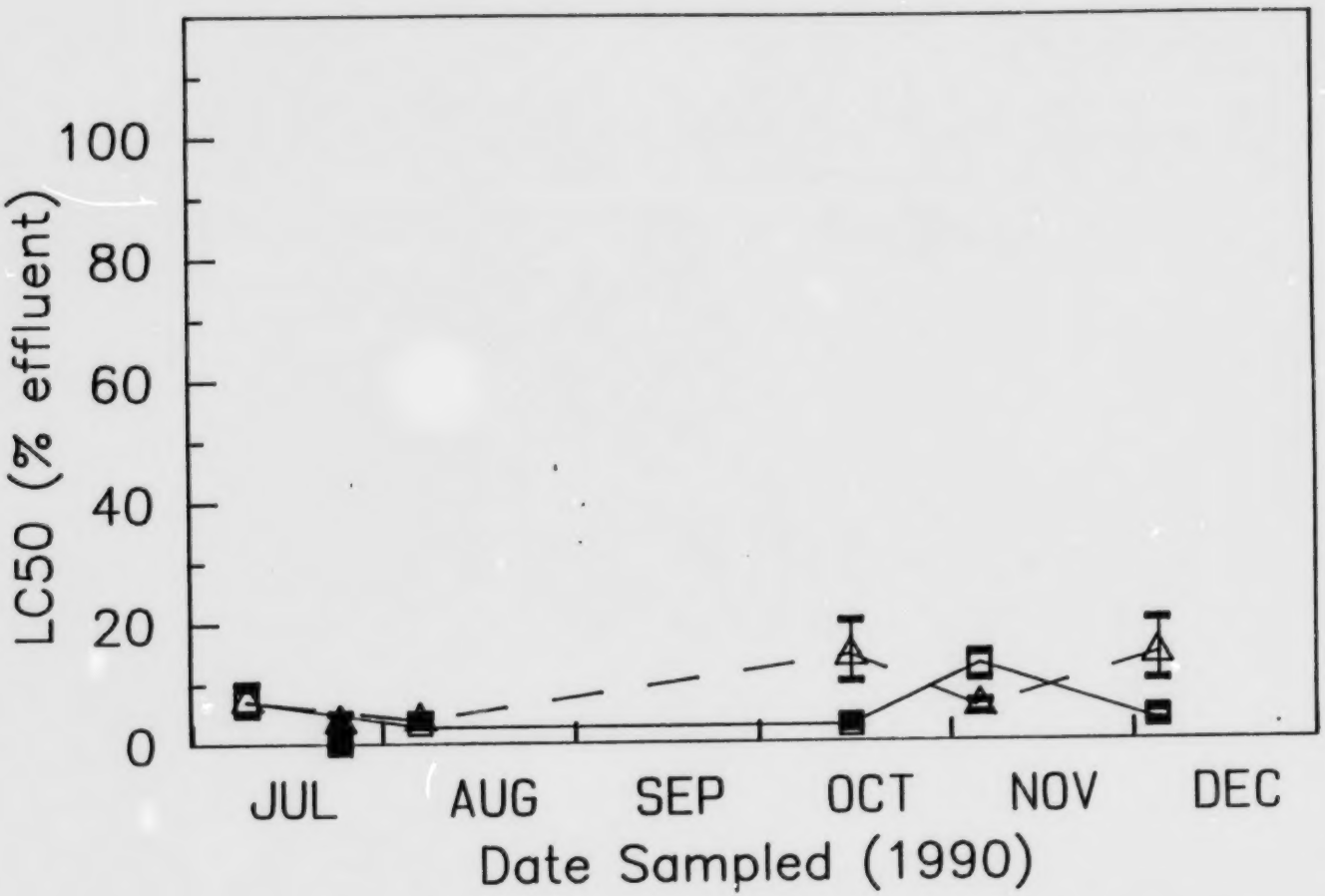


Figure 3. The toxicity of effluent samples from Abitibi-Price Inc., Fort William Division, Thunder Bay, Bark Lagoon # 2. (Δ Trout, □ *Daphnia magna*). Solid symbols are audit samples.

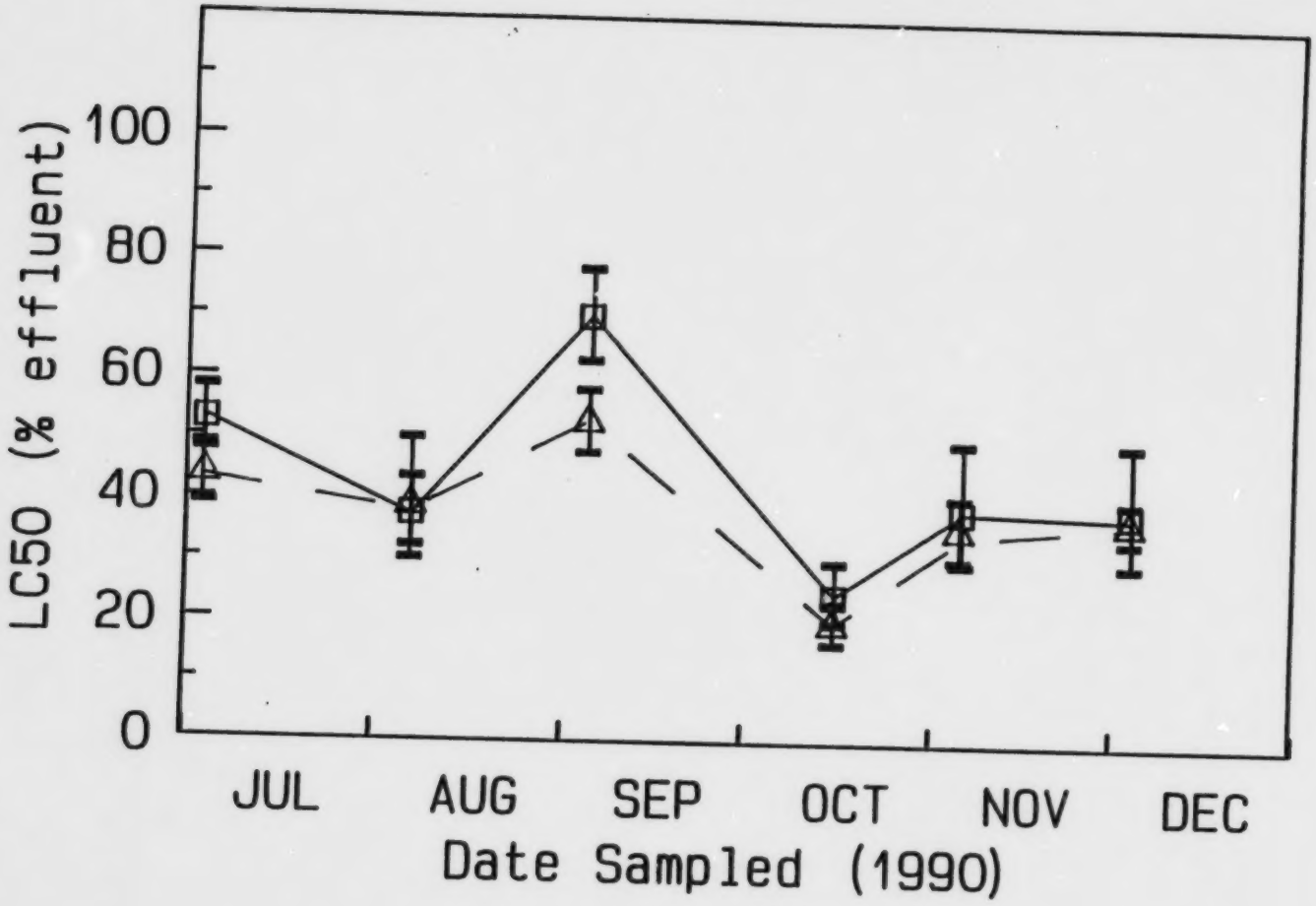


Figure 4. The toxicity of effluent samples from Abitibi-Price Inc., Thunder Bay Division, Thunder Bay, Primary Lagoon Outfall #2. (Δ Trout, □ *Daphnia magna*).

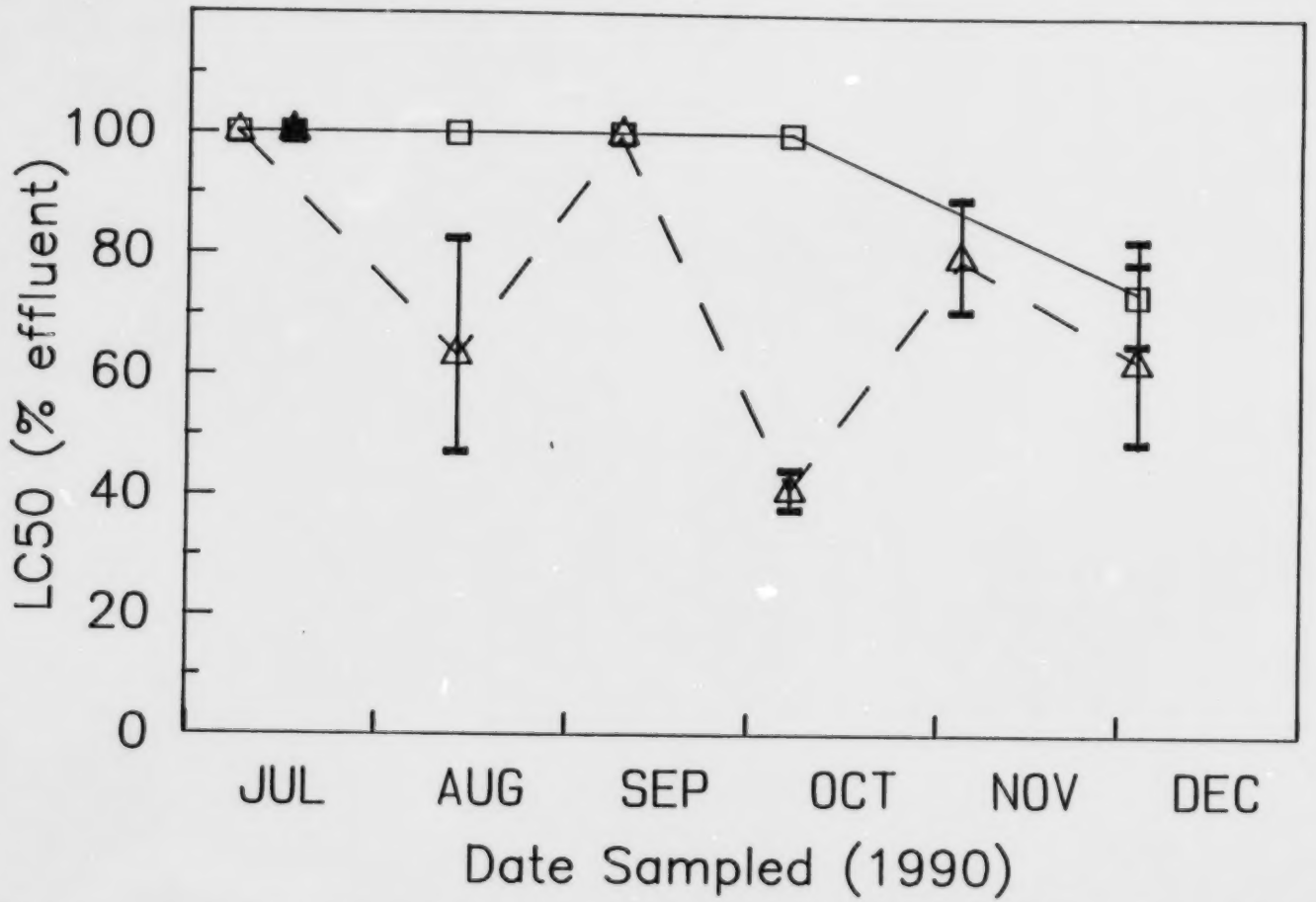


Figure 5. The toxicity of effluent samples from Boise Cascade Canada Ltd., Fort Frances, Total Mill Effluent. (Δ Trout, □ *Daphnia magna*). Solid symbols are audit samples.

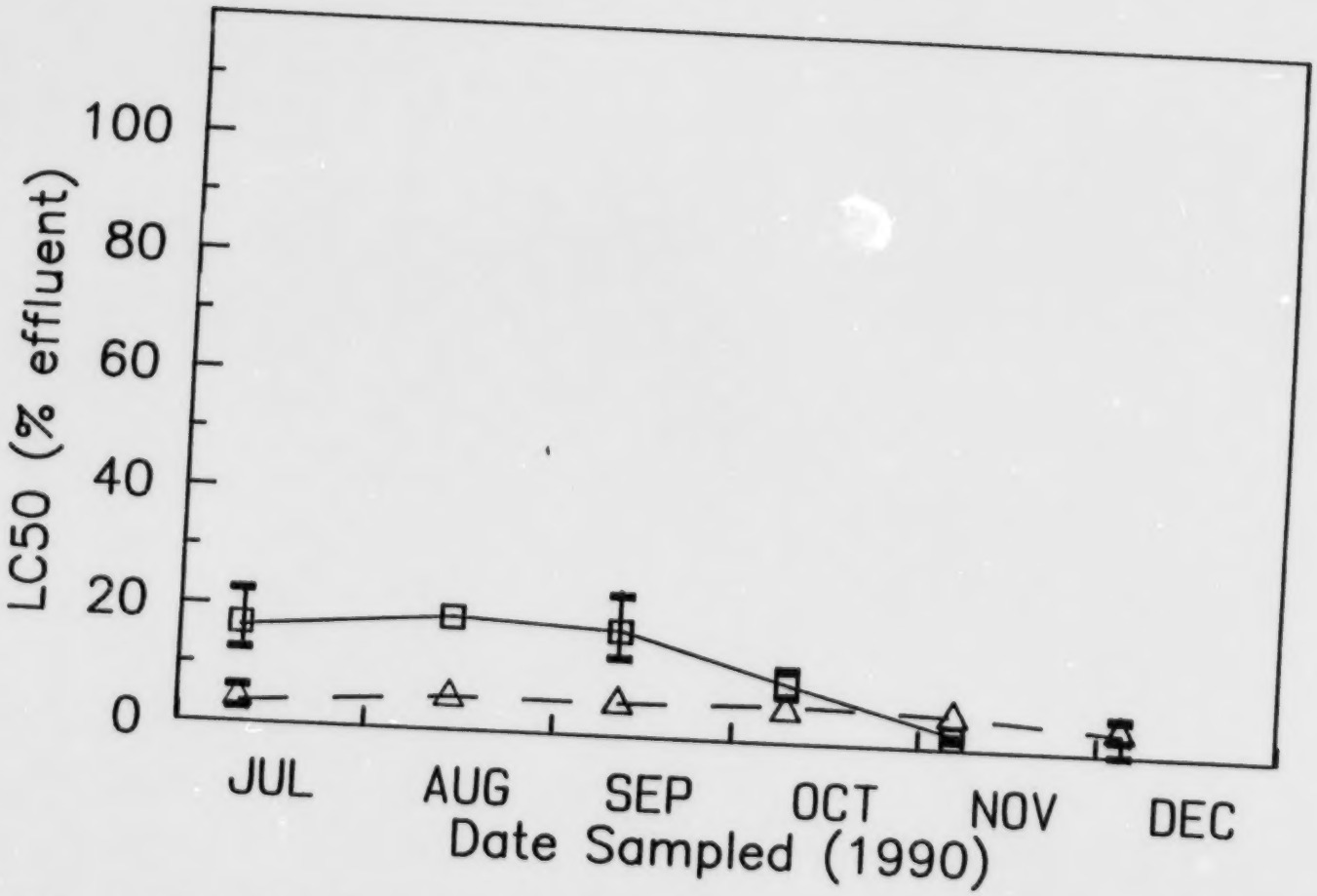


Figure 6. The toxicity of effluent samples from Boise Cascade Canada Ltd., Kenora, Final Effluent. (Δ Trout, □ *Daphnia magna*).

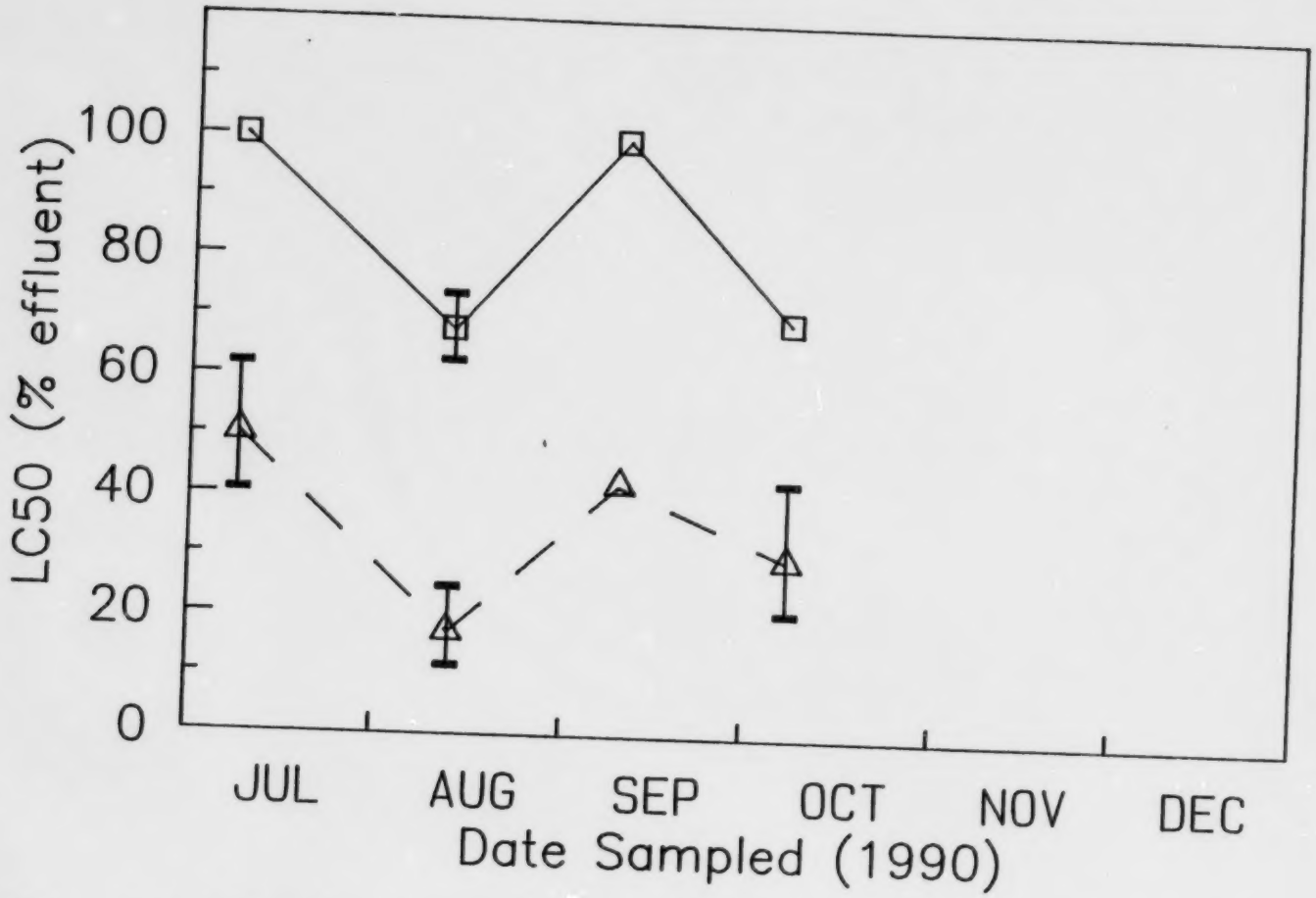


Figure 7. The toxicity of effluent samples from Canadian Pacific Forest Products Ltd., Thunder Bay, Combined Mill Outfall. (Δ Trout, □ *Daphnia magna*).

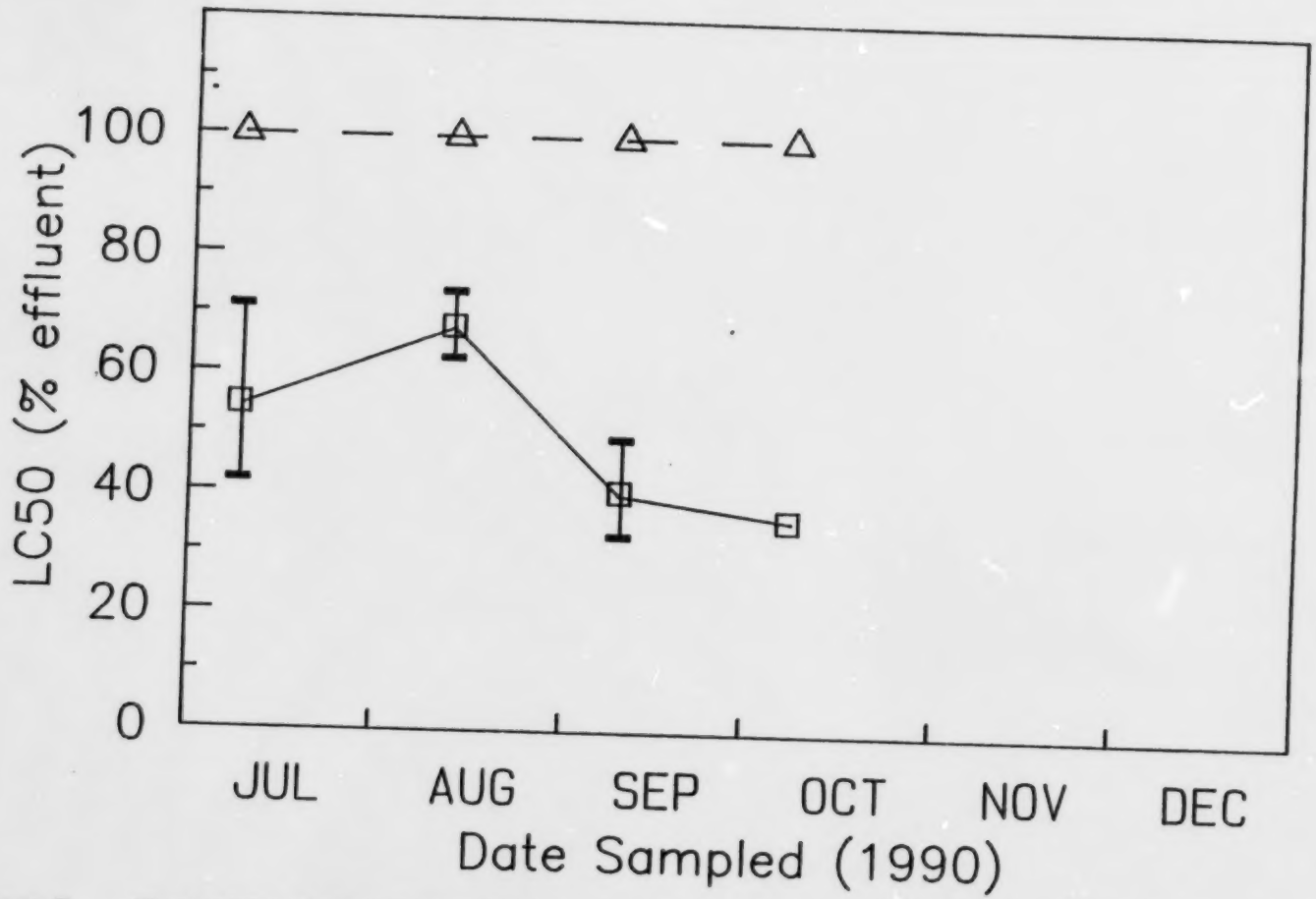


Figure 8. The toxicity of effluent samples from Canadian Pacific Forest Products Ltd., Thunder Bay, Clean Water Outfall. (Δ Trout, □ *Daphnia magna*).

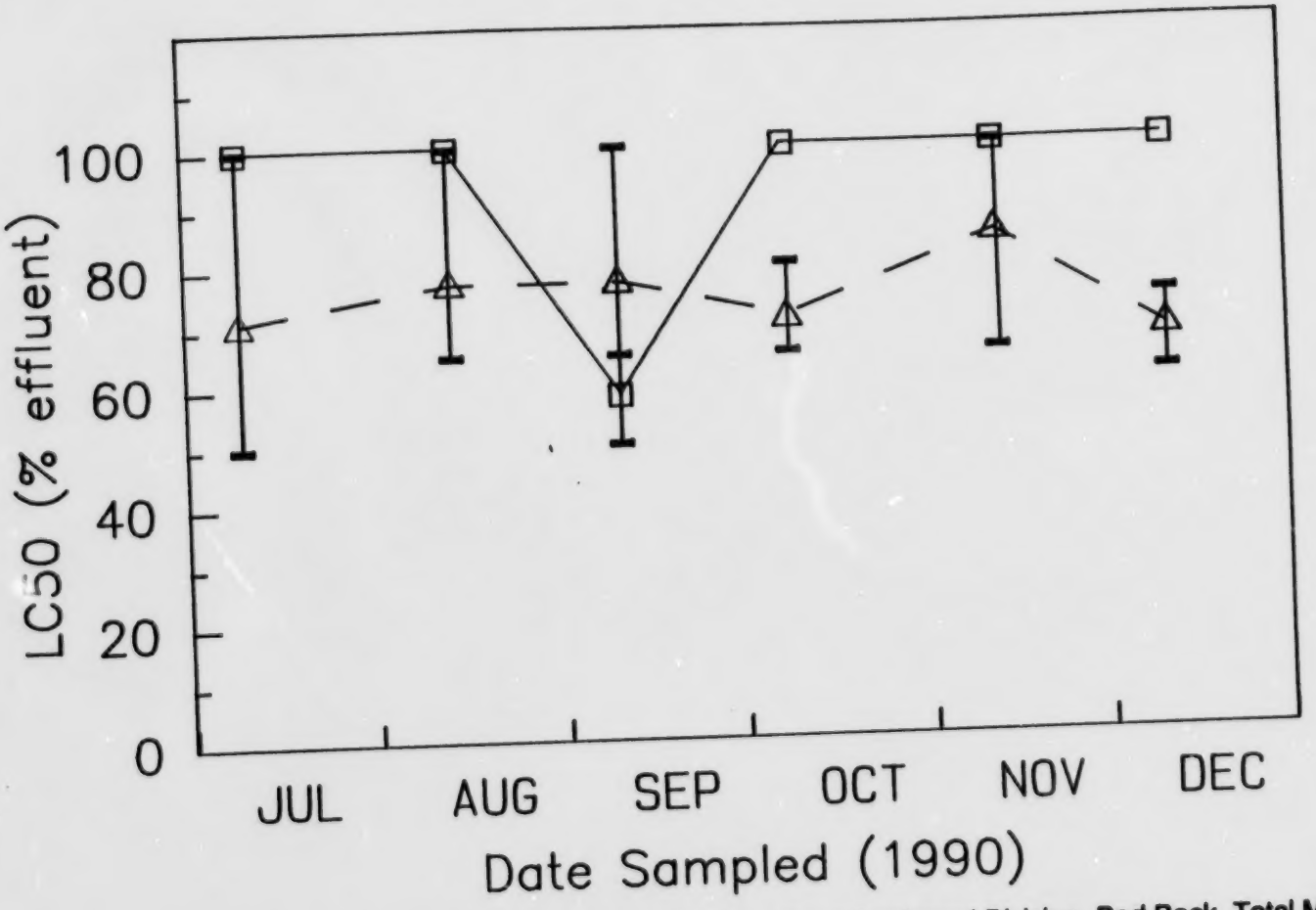


Figure 9. The toxicity of effluent samples from Domtar Inc., Containerboard Division, Red Rock, Total Mill Outfall Stream. (Δ Trout, □ *Daphnia magna*).

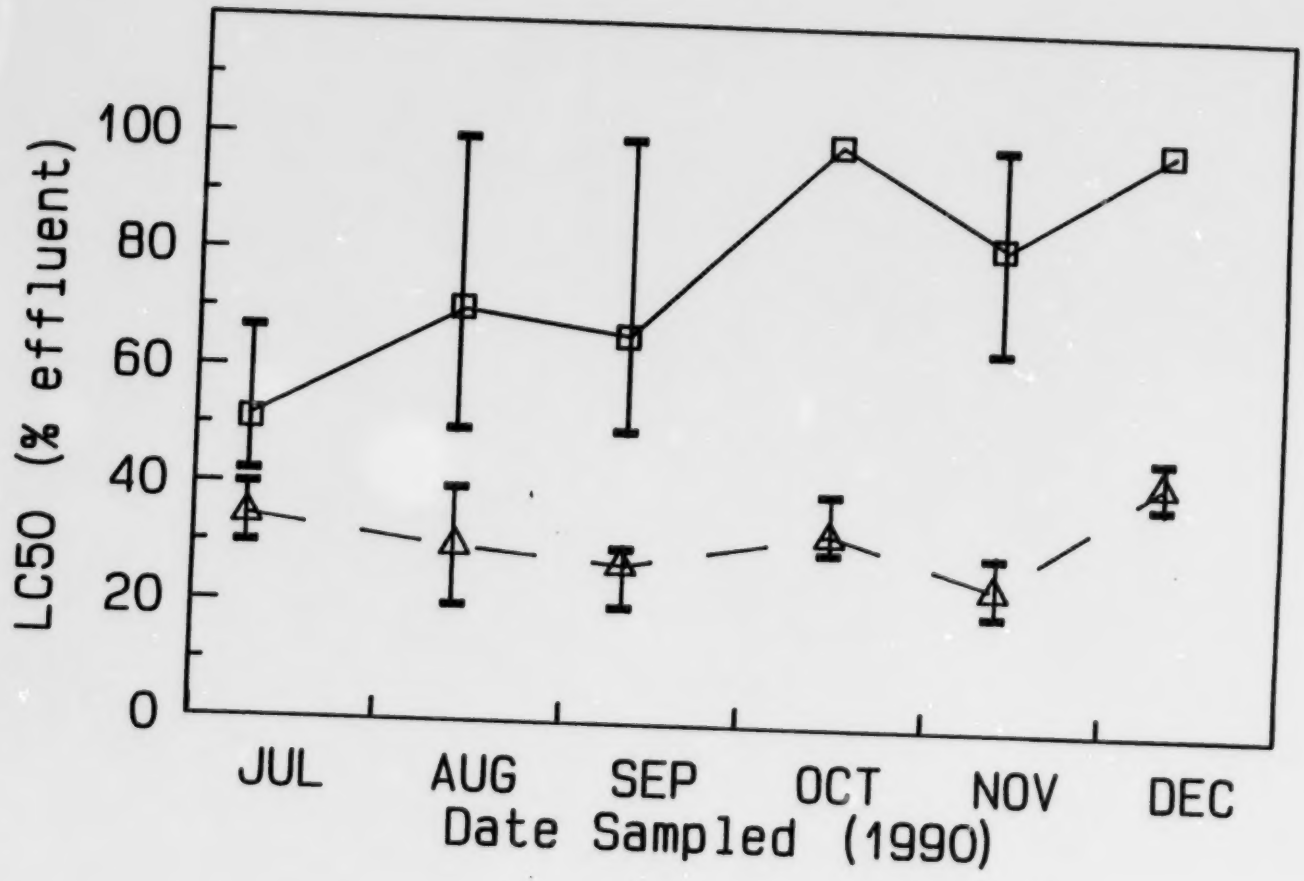


Figure 10. The toxicity of effluent samples from Domtar Inc., Containerboard Division, Trenton, Mill Combined Effluent. (Δ Trout, □ *Daphnia magna*).

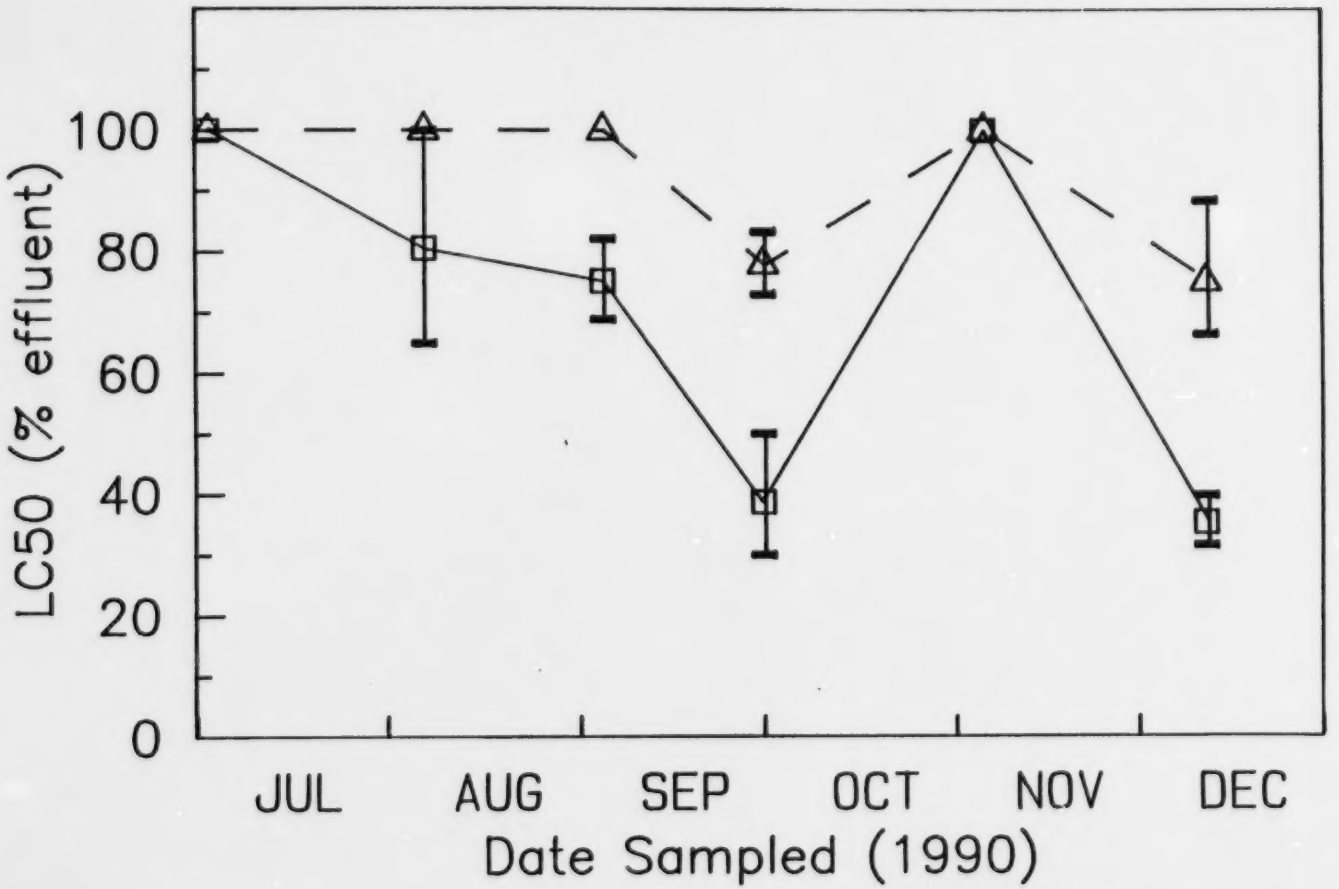


Figure 11. The toxicity of effluent samples from E.B. Eddy Forest Products Ltd., Ottawa, Effluent Discharge. (Δ Trout, □ *Daphnia magna*).

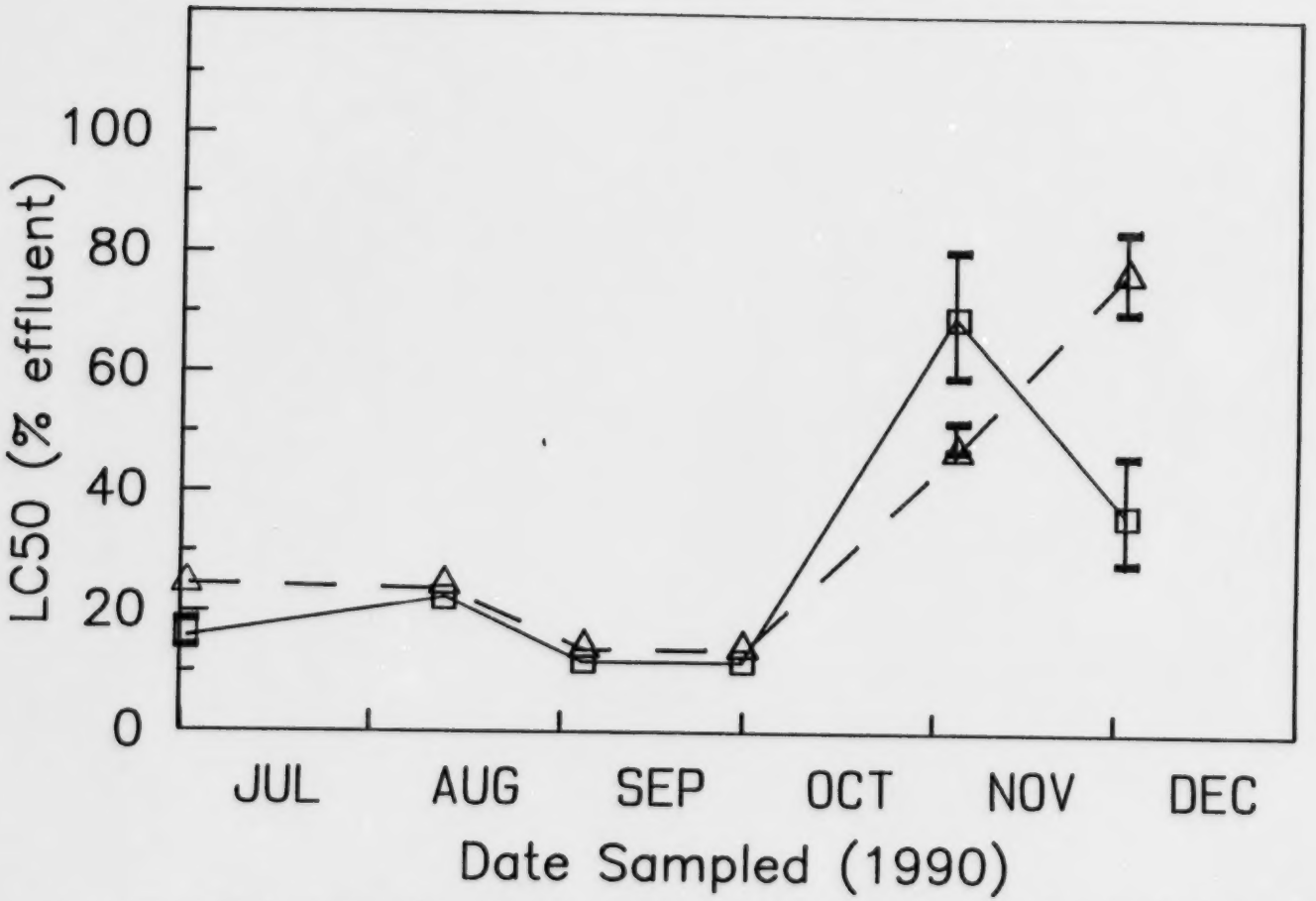


Figure 12. The toxicity of effluent samples from James River-Marathon Ltd., Marathon, Final Effluent PE1. (Δ Trout, □ *Daphnia magna*).

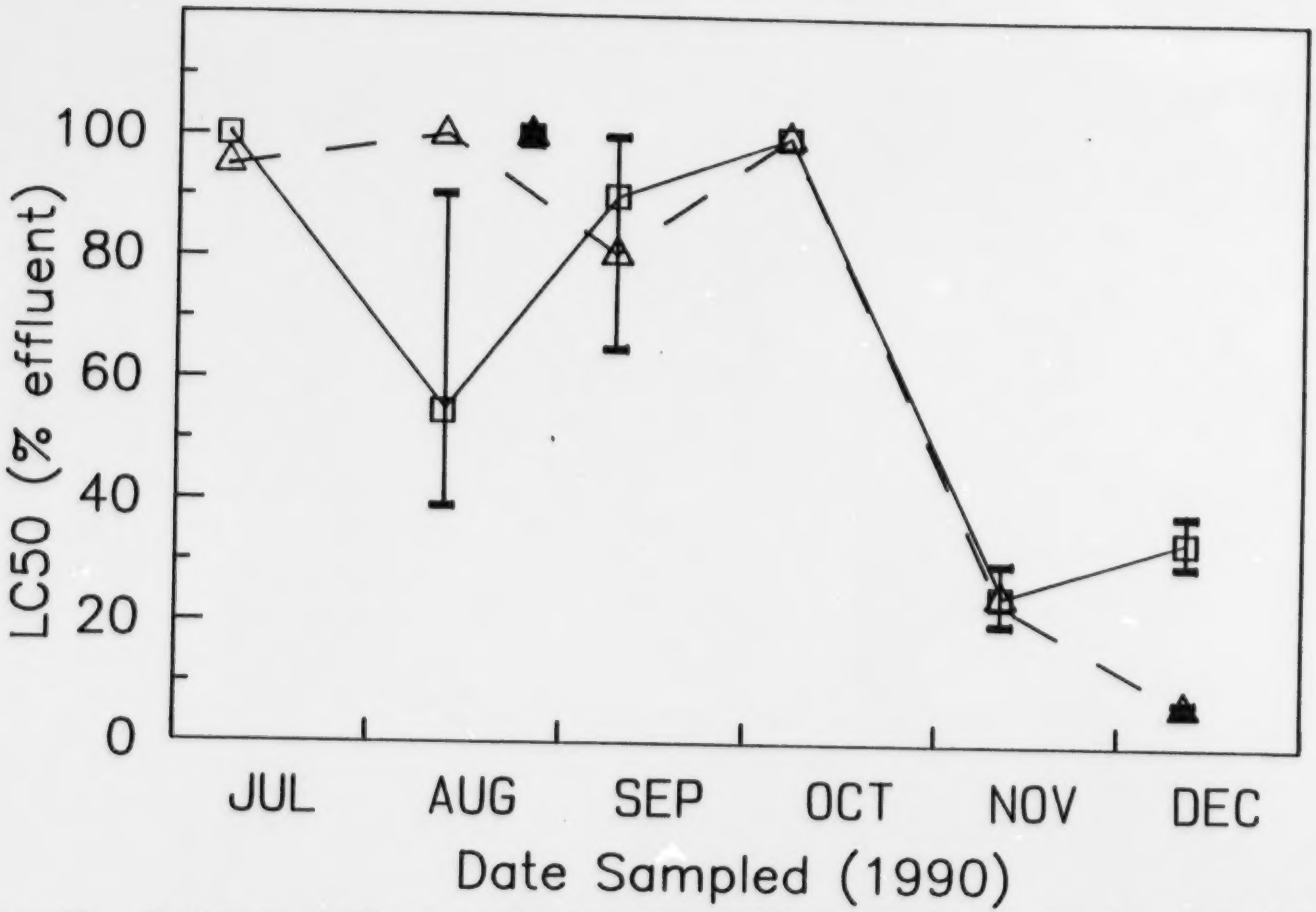


Figure 13. The toxicity of effluent samples from Malette Kraft Pulp and Power Co., Smooth Rock Falls, Final Effluent. (Δ Trout, □ *Daphnia magna*). Solid symbols are audit samples.

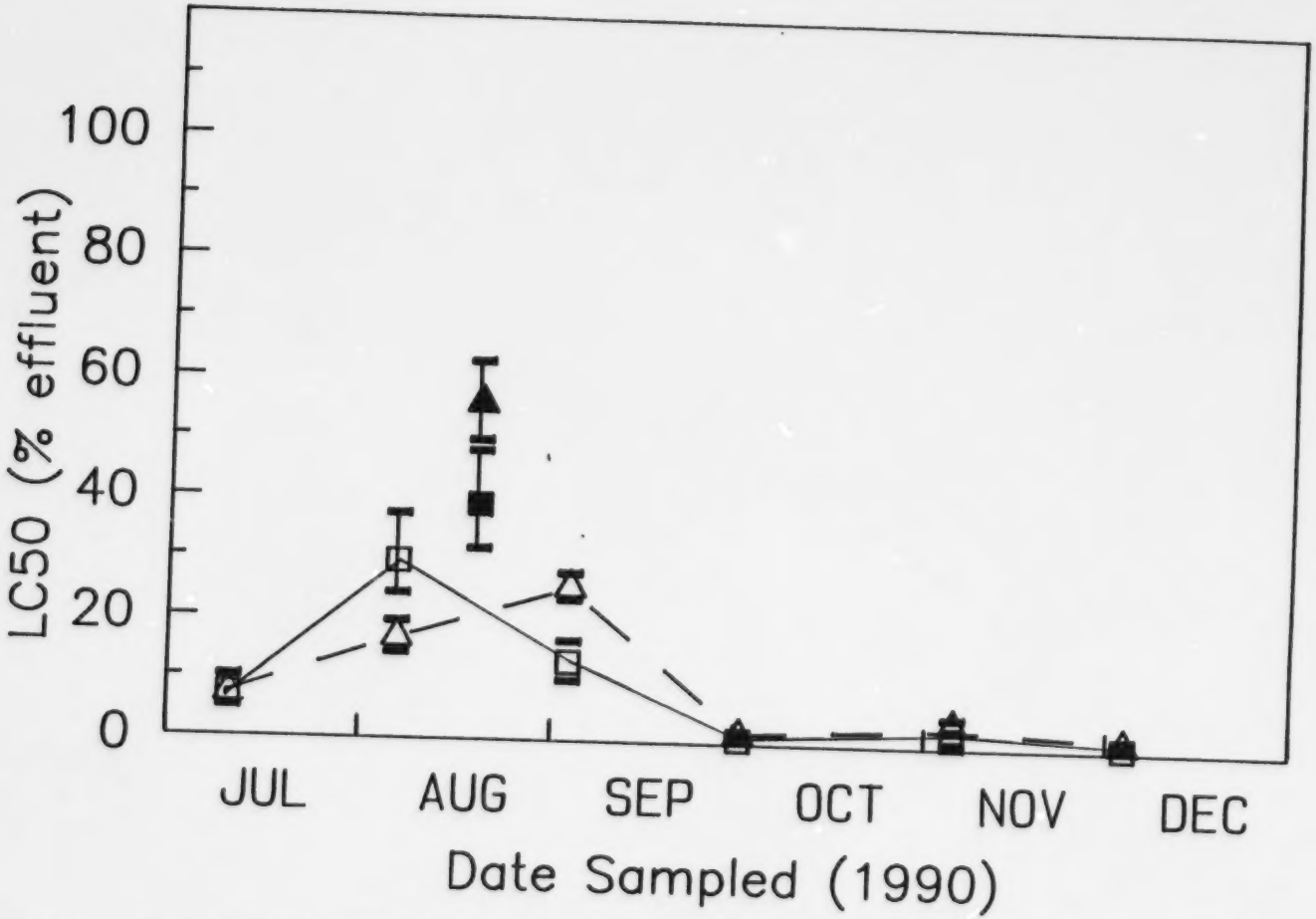


Figure 14. The toxicity of effluent samples from Noranda Forest Inc., Recycled Papers, Thorold, Circular Clarifier. (Δ Trout, □ *Daphnia magna*). Solid symbols are audit samples.

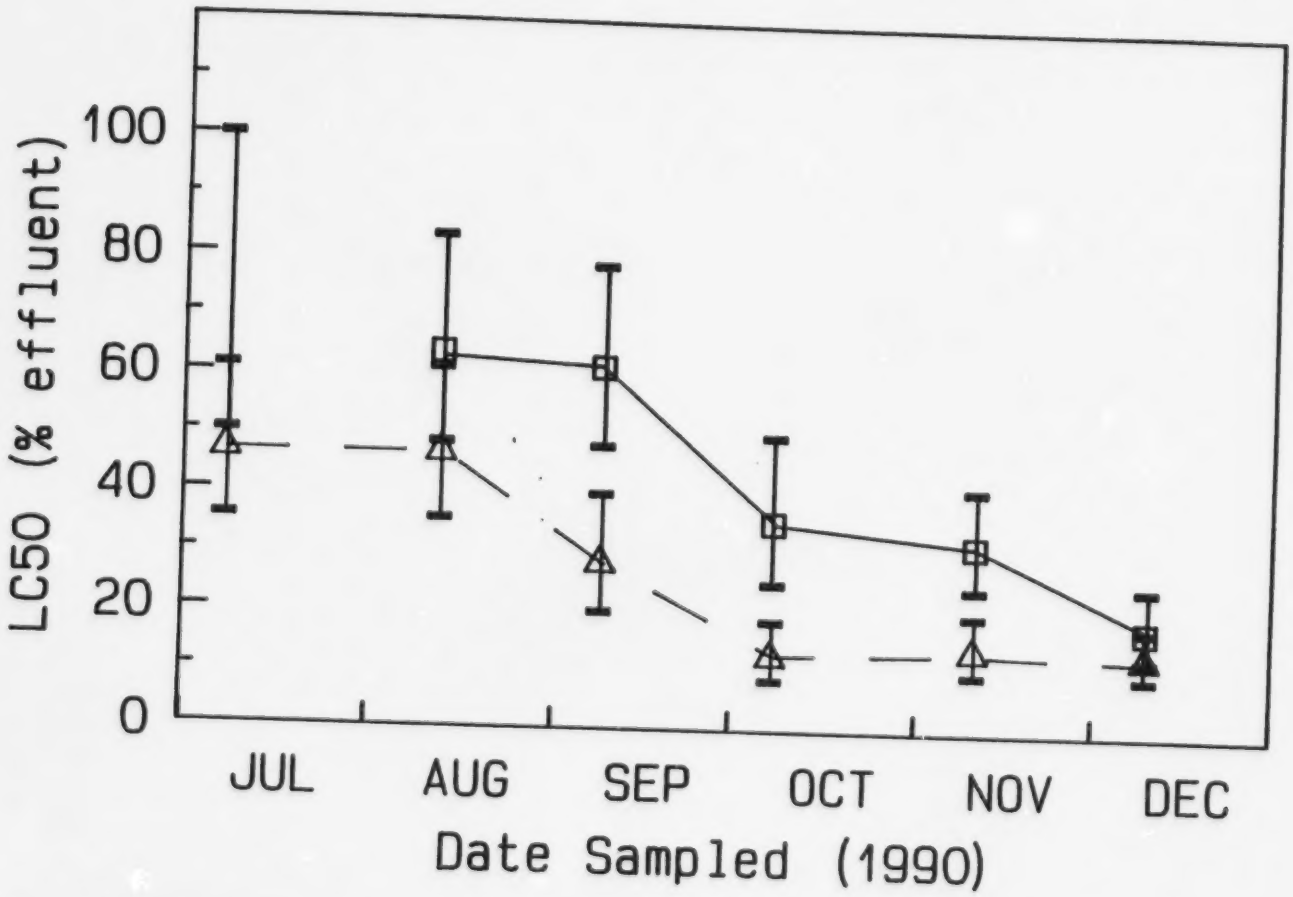


Figure 15. The toxicity of effluent samples from Spruce Falls Power and Paper Co., Kapuskasing, Mill Main Sewer. (Δ Trout, □ *Daphnia magna*).

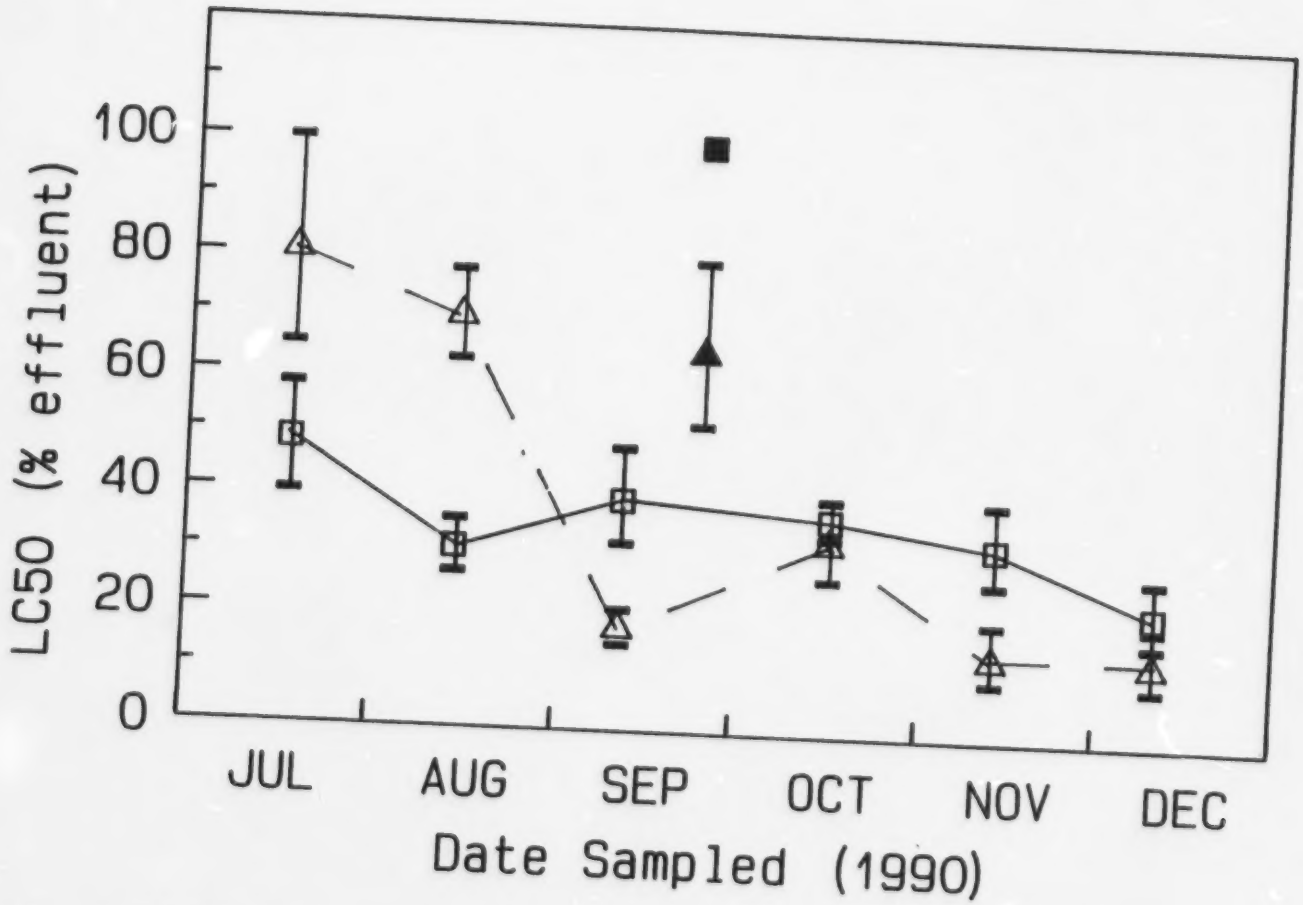


Figure 16. The toxicity of effluent samples from St. Mary's Paper Inc., Sault Ste. Marie, Clear to River. (Δ Trout, □ *Daphnia magna*). Solid symbols are audit samples.

COMPANY: Abitibi-Price Inc., Iroquois Falls
(860403)
(now with Iroquois Falls Division)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY
The data for five tests of rainbow trout acute lethality conducted on samples of Total Outfall effluent collected between July and December 1990 were provided by Abitibi-Price Inc., Iroquois Falls. The samples were lethal, and the LC50s ranged from 7.6 to 16.7 % effluent. A Ministry audit sample in October was lethal, and the LC50 was 5.8 % effluent.

The data for two tests of rainbow trout acute lethality conducted on samples of Cooling Water effluent collected between July and December 1990 were provided by Abitibi-Price Inc., Iroquois Falls. The samples were non-lethal.

Total Outfall

06900919 sampled: 07/09/90 LC50: 13.2 %
95% fid. limits: 11.5 - 15.0 %
comments: 100% MORTALITY IN 20% TEST CONCENTRATION.

06901109 sampled: 08/06/90 LC50: 16.7 %
95% fid. limits: 14.2 - 19.5 %
comments: 70% MORTALITY IN 20% TEST CONCENTRATION.

06901705 sampled: 10/15/90 LC50: 14.1 %
95% fid. limits: 10.0 - 20.0 %
comments: COMPLETE MORTALITY IN 20% TEST CONCENTRATION.

01900240 sampled: 10/23/90 LC50: 5.8 %
95% fid. limits: 5.4 - 6.3 %
comments: MISA Audit

06901854 sampled: 11/05/90 LC50: 12.3 %
95% fid. limits: 10.3 - 14.6 %
comments: 20% MORTALITY IN 10% TEST CONCENTRATION.

06902054 sampled: 12/03/90 LC50: 7.6 %
95% fid. limits: 5.9 - 9.9 %
comments: 30% MORTALITY IN 5% TEST CONCENTRATION.

Emergency Overflow

C4

C6

Filter Plant Sewer

Rain Gauge

Intake Water

Cooling Water

06900921 sampled: 07/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901707 sampled: 10/15/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

COMPANY: Abitibi-Price Inc., Iroquois Falls (860403)
(now with Iroquois Falls Division)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY
The data for five tests of Daphnia magna acute lethality conducted on samples of Total Outfall effluent collected between July and December 1990 were provided by Abitibi-Price Inc., Iroquois Falls. The samples were lethal, and the LC50s ranged from 14.1 to 24.5 % effluent. A Ministry audit sample in October was lethal, and the LC50 was 18.8 % effluent.

The data for five tests of Daphnia magna acute lethality conducted on samples of Cooling Water effluent collected between July and December 1990 were provided by Abitibi-Price Inc., Iroquois Falls. The samples were non-lethal.

Total Outfall

06900920 sampled: 07/09/90 LC50: 17.6 %
95% fid. limits: 14.8 - 20.8 %
comments: 60% MORTALITY IN THE 20% CONCENTRATION

06901110 sampled: 08/06/90 LC50: 14.1 %
95% fid. limits: 10.0 - 20.0 %
comments: 100% MORTALITY IN 20% TEST CONCENTRATION.

06901706 sampled: 10/15/90 LC50: 17.6 %
95% fid. limits: 14.9 - 20.9 %
comments: 60% MORTALITY IN 20% TEST CONCENTRATION.

02900240 sampled: 10/23/90 LC50: 18.8 %
95% fid. limits: 13.6 - 26.1 %
comments: MISA Audit\Low pH & D.O.

06901855 sampled: 11/05/90 LC50: 24.5 %
95% fid. limits: 20.0 - 30.0 %
comments: 100% MORTALITY IN 30% TEST CONCENTRATION.

06902055 sampled: 12/03/90 LC50: 14.1 %
95% fid. limits: 10.0 - 20.0 %
comments: COMPLETE MORTALITY IN 20% TEST CONCENTRATION.

Emergency Overflow

C4

C6

Filter Plant Sewer

Rain Gauge

Intake Water

Cooling Water

06900922 sampled: 07/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED DURING TE

06901112 sampled: 08/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901708 sampled: 10/15/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901856 sampled: 11/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06902056 sampled: 12/03/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

COMPANY: Abitibi-Price Inc. Fine Papers Div., Thunder Bay (860106)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for two tests of rainbow trout acute lethality conducted on samples of Lagoon Outfall effluent collected between July and December 1990 were provided by Abitibi-Price Inc., Fine Papers Division, Thunder Bay. The samples were non-lethal.

Lagoon Outfall

06900927 sampled: 07/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901699 sampled: 10/16/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

C3

C4

Rain Gauge

Intake Water

C2

COMPANY: Abitibi-Price Inc. Fine Papers Div., Thunder Bay (860106)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for five tests of Daphnia magna acute lethality conducted on samples of Lagoon Outfall effluent collected between July and December 1990 were provided by Abitibi-Price Inc., Fine Papers Division, Thunder Bay. The samples were non-lethal.

Lagoon Outfall

06900928 sampled: 07/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED DURING TE

06901113 sampled: 08/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901700 sampled: 10/16/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901853 sampled: 11/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06902050 sampled: 12/04/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

C3

C4

Rain Gauge

Intake Water

C2

COMPANY: Abitibi-Price Inc. Fort William, Thunder Bay (860205)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for five tests of rainbow trout acute lethality conducted on samples of Main Sewer Lagoon #1 effluent collected between July and December 1990 were provided by Abitibi-Price Inc., Fort William Division, Thunder Bay. The samples were lethal, and the LC50s ranged from 10.0 to 24.5 % effluent. A Ministry audit sample in July was lethal, and the LC50 was 12.1 % effluent.

The data for five tests of rainbow trout acute lethality conducted on samples of Bark Lagoon #2 effluent collected between July and December 1990 were provided by Abitibi-Price Inc., Fort William Division, Thunder Bay. The samples were lethal, and the LC50s ranged from 3.9 to 14.1 % effluent. A Ministry audit sample in July was lethal, and the LC50 was 3.5 % effluent.

Main Sewer Lagoon #1

06900923 sampled: 07/10/90 LC50: 15.9 %
95% fid. limits: 12.0 - 19.7 %
comments: 100% MORTALITY IN THE 30% CONCENTRATION

01900154 sampled: 07/25/90 LC50: 12.1 %
95% fid. limits: 10.3 - 14.3 %
comments: MISA Audit

06901114 sampled: 08/07/90 LC50: 19.7 %
95% fid. limits: 16.5 - 23.3 %
comments: 40% MORTALITY IN 20% TEST CONCENTRATION.

06901703 sampled: 10/16/90 LC50: 24.5 %
95% fid. limits: 20.0 - 30.0 %
comments: COMPLETE MORTALITY IN 30% TEST CONCENTRATION

06901847 sampled: 11/06/90 LC50: 10.0 %
95% fid. limits: 8.0 - 12.4 %
comments: 50% MORTALITY IN 10% TEST CONCENTRATION.

06902057 sampled: 12/05/90 LC50: 11.5 %
95% fid. limits: 9.3 - 14.0 %
comments: 30% MORTALITY IN 10% TEST CONCENTRATION.

Bark Lagoon #2

06900925 sampled: 07/10/90 LC50: 7.1 %
95% fid. limits: 5.0 - 10.0 %
comments: 100% MORTALITY IN 10% TEST CONCENTRATION

01900153 sampled: 07/25/90 LC50: 3.5 %
95% fid. limits: 2.5 - 5.1 %
comments: MISA Audit

06901117 sampled: 08/07/90 LC50: 3.9 %
95% fid. limits: 3.0 - 5.0 %
comments: 100% MORTALITY IN 5% TEST CONCENTRATION.

06901701 sampled: 10/16/90 LC50: 14.1 %
95% fid. limits: 10.0 - 20.0 %
comments: COMPLETE MORTALITY IN 20% TEST CONCENTRATION.

06901849 sampled: 11/06/90 LC50: 5.6 %
95% fid. limits: 4.6 - 6.6 %
comments: 40% MORTALITY IN 5% TEST CONCENTRATION.

06902052 sampled: 12/05/90 LC50: 14.1 %
95% fid. limits: 10.0 - 20.0 %
comments: COMPLETE MORTALITY IN 20% TEST CONCENTRATION.

Storm Drainage E

Storm Drainage F

Rain Gauge

Intake Water

Main Sewer Lagoon # 2

COMPANY: Abitibi-Price Inc. Fort William, Thunder Bay (860205)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY

The data for five tests of Daphnia magna acute lethality conducted on samples of Main Sewer Lagoon #1 effluent collected between July and December 1990 were provided by Abitibi-Price Inc., Fort William Division, Thunder Bay. The samples were lethal, and the LC50s ranged from 14.1 to 38.7 % effluent. A Ministry audit sample in July was lethal, and the LC50 was 17.1 % effluent.

The data for five tests of Daphnia magna acute lethality conducted on samples of Bark Lagoon #2 effluent collected between July and December 1990 were provided by Abitibi-Price Inc., Fort William Division, Thunder Bay. The samples were lethal, and the LC50s ranged from 2.8 to 12.3 % effluent. A Ministry audit sample in July was lethal, and the LC50 was less than 5.0 % effluent.

Main Sewer Lagoon #1

06900924 sampled: 07/10/90 LC50: 24.5 %
95% fid. limits: 19.9 - 29.6 % slope: 9.7
comments: 20% MORTALITY IN THE 20% CONCENTRATION

02900154 sampled: 07/25/90 LC50: 17.1 %
95% fid. limits: 7.8 - 27.1 % slope: 2.7
comments: MISA Audit; Low D.O.

06901115 sampled: 08/07/90 LC50: 35.3 %
95% fid. limits: 31.4 - 39.6 %
comments: 100% MORTALITY IN 50% TEST CONCENTRATION.

06901704 sampled: 10/16/90 LC50: 38.7 %
95% fid. limits: 30.0 - 50.0 %
comments: COMPLETE MORTALITY IN 50% TEST CONCENTRATION.

06901848 sampled: 11/06/90 LC50: 19.7 %
95% fid. limits: 16.6 - 23.3 %
comments: 40% MORTALITY IN 20% TEST CONCENTRATION.

06902058 sampled: 12/05/90 LC50: 14.1 %
95% fid. limits: 10.0 - 20.0 %
comments: COMPLETE MORTALITY IN 20% TEST CONCENTRATION.

Bark Lagoon #2

06900926 sampled: 07/10/90 LC50: 7.1 %
95% fid. limits: 5.0 - 10.0 %
comments: 100% MORTALITY IN THE 10% CONCENTRATION

02900153 sampled: 07/25/90 LC50: 0.0 - 5.0 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; High Conductivity & Low D.O.

06901116 sampled: 08/07/90 LC50: 3.4 %
95% fid. limits: 2.9 - 3.8 %
comments: 100% MORTALITY IN 5% TEST CONCENTRATION.

06901702 sampled: 10/16/90 LC50: 2.8 %
95% fid. limits: 2.2 - 3.6 %
comments: 40% MORTALITY IN 3% TEST CONCENTRATION.

06901850 sampled: 11/06/90 LC50: 12.3 %
95% fid. limits: 10.3 - 14.7 %
comments: 20% MORTALITY IN 10% TEST CONCENTRATION.

06902053 sampled: 12/05/90 LC50: 3.9 %
95% fid. limits: 3.0 - 5.0 %
comments: COMPLETE MORTALITY IN 5% TEST CONCENTRATION.

Storm Drainage E

Storm Drainage F

Rain Gauge

Intake Water

Main Sewer Lagoon # 2

COMPANY: Abitibi-Price Inc. Thunder Bay Div., Thunder Bay (860007)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Primary Lagoon Outfall #2 effluent collected between July and December 1990 were provided by Abitibi-Price Inc., Thunder Bay Division, Thunder Bay. The samples were lethal, and the LC50s ranged from 19.7 to 52.8 % effluent.

Primary Lagoon Outfall #2

06900839 sampled: 07/04/90 LC50: 43.5 %
95% fid. limits: 38.9 - 48.6 %
comments: 70% MORTALITY IN 50% TEST CONCENTRATION.

06901128 sampled: 08/07/90 LC50: 38.7 %
95% fid. limits: 30.0 - 50.0 %
comments: 100% MORTALITY IN 50% TEST CONCENTRATION.

06901338 sampled: 09/05/90 LC50: 52.8 %
95% fid. limits: 47.8 - 58.1 %
comments: 20% MORTALITY IN 50% TEST CONCENTRATION.

06901713 sampled: 10/16/90 LC50: 19.7 %
95% fid. limits: 16.5 - 23.3 %
comments: 40% MORTALITY IN 20% TEST CONCENTRATION.

06901851 sampled: 11/06/90 LC50: 33.8 %
95% fid. limits: 29.5 - 38.5 %
comments:

06902059 sampled: 12/04/90 LC50: 37.0 %
95% fid. limits: 33.9 - 40.4 %
comments: COMPLETE MORTALITY IN 50% TEST CONCENTRATION.

P4

C3

Rain Gauge

COMPANY: Abitibi-Price Inc. Thunder Bay Div., Thunder Bay (860007)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Primary Lagoon Outfall #2 effluent collected between July and December 1990 were provided by Abitibi-Price Inc., Thunder Bay Division, Thunder Bay. The samples were lethal, and the LC50s ranged from 24.5 to 70.2 % effluent.

Primary Lagoon Outfall #2

06900840 sampled: 07/04/90 LC50: 52.8 %
95% fid. limits: 47.8 - 58.1 %
comments: 20% MORTALITY IN THE 50% CONCENTRATION

06901127 sampled: 08/07/90 LC50: 37.6 %
95% fid. limits: 32.3 - 43.6 %
comments: 80% MORTALITY IN 50% TEST CONCENTRATION.

06901339 sampled: 09/05/90 LC50: 70.2 %
95% fid. limits: 63.0 - 78.1 %
comments: 40% MORTALITY IN 65% TEST CONCENTRATION.

06901714 sampled: 10/16/90 LC50: 24.5 %
95% fid. limits: 20.0 - 30.0 %
comments: COMPLETE MORTALITY IN 30% TEST CONCENTRATION.

06901852 sampled: 11/06/90 LC50: 38.7 %
95% fid. limits: 30.0 - 50.0 %
comments: 100% MORTALITY IN 50% TEST CONCENTRATION.

06902060 sampled: 12/04/90 LC50: 38.7 %
95% fid. limits: 30.0 - 50.0 %
comments: COMPLETE MORTALITY IN 50% TEST CONCENTRATION.

P4

C3

Rain Gauge

COMPANY: Beaver Wood Fibre Company Limited, Thorold (1620004)
SECTOR: pulp and paper
REGION: West Central

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Process Effluent P-1 collected between July and December 1990 were provided by Beaver Wood Fibre Co. Ltd., Thorold. Four samples were non-lethal, and two samples were LC50 > 100 % effluent. A Ministry audit sample in October was non-lethal.

The data for six tests of rainbow trout acute lethality conducted on samples of Spill P-2 (CW) collected between July and December 1990 were provided by Beaver Wood Fibre Co. Ltd., Thorold. Three samples were non-lethal, and two samples were LC50 > 100 % effluent. One sample was lethal, and the LC50 was 32.2 % effluent. A Ministry audit sample in August was lethal, and the LC50 was 51.0 % effluent.

Process Effluent P-1

06900905 sampled: 07/10/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY AT 50 AND 100% CONCENTRATIONS

06901219 sampled: 08/21/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901420 sampled: 09/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901624 sampled: 10/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

01900234 sampled: 10/16/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Non-lethal

06901894 sampled: 11/13/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN THE 100% CONCENTRATION

06902114 sampled: 12/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Intake Water

Spill P-2 (CW)

06900907 sampled: 07/10/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN THE 65% CONCENTRATION

06901221 sampled: 08/21/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

01900186 sampled: 08/28/90 LC50: 51.0 %
95% fid. limits: 40.0 - 65.0 %
comments: MISA Audit Sample.

06901422 sampled: 09/11/90 LC50: 32.2 %
95% fid. limits: 28.0 - 37.2 %
comments: 40% MORTALITY IN 30% TEST CONCENTRATION.

06901626 sampled: 10/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901892 sampled: 11/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06902116 sampled: 12/11/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN 65% TEST CONCENTRATION.

Spill P-2 (EO)

COMPANY: Beaver Wood Fibre Company Limited, Thorold (1620004)
SECTOR: pulp and paper
REGION: West Central

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Process Effluent P-1 collected between July and December 1990 were provided by Beaver Wood Fibre Co. Ltd., Thorold. Three samples were lethal, and the LC50s ranged from 77.2 to 85.1 % effluent. Two samples were non-lethal, and one sample was LC50 > 100 % effluent. A Ministry audit sample in October was lethal, and the LC50 was 42.0 % effluent.

The data for six tests of Daphnia magna acute lethality conducted on samples of Spill P-2 (CW) effluent collected between July and December 1990 were provided by Beaver Wood Fibre Co. Ltd., Thorold. Four samples were non-lethal, and one sample was LC50 > 100 % effluent. One sample was lethal, and the LC50 was 31.4 % effluent. A Ministry audit sample in August was lethal, and the LC50 was 30 to 60 % effluent.

Process Effluent P-1

06900906 sampled: 07/10/90 LC50: 80.6 %
95% fid. limits: 65.0 - 100.0 %
comments: COMPLETE MORTALITY IN FULL STRENGTH EFFLUENT

06901220 sampled: 08/21/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901421 sampled: 09/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901625 sampled: 10/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 20% MORTALITY IN 100% TEST CONCENTRATION.

02900234 sampled: 10/16/90 LC50: 42.0 %
95% fid. limits: 40.6 - 43.5 %
comments: MISA Audit

06901895 sampled: 11/13/90 LC50: 85.1 %
95% fid. limits: 69.4 - 142.8 % slope: 6.0
comments: PARTIAL MORTALITY IN THE 65% AND 100% CONC.

06902115 sampled: 12/11/90 LC50: 77.2 %
95% fid. limits: 54.5 - 106.1 %
comments: 50% MORTALITY IN 65% TEST CONCENTRATION.

Intake Water

Spill P-2 (CW)

06900908 sampled: 07/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901222 sampled: 08/21/90 LC50: 31.4 %
95% fid. limits: 26.1 - 38.9 % slope: 8.6
comments: 30% MORTALITY IN 30% TEST CONCENTRATION.

02900186 sampled: 08/28/90 LC50: 30.0 - 60.0 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Very low D.O., High Concuctivity

06901423 sampled: 09/11/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 20% MORTALITY IN 65% AND 100% TEST CONC.

06901627 sampled: 10/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901893 sampled: 11/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED

06902117 sampled: 12/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Spill P-2 (EO)

COMPANY: Boise Cascade Canada Ltd., Fort Frances (870105)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of rainbow trout acute lethality were conducted on samples of Total Mill Final Effluent collected between July and December 1990 were provided by Boise Cascade Canada, Ltd., Fort Frances. Four samples were lethal, and the LC50s ranged from 40.8 to 79.7 % effluent. One sample was non-lethal, and one sample was LC50 > 100 % effluent. A Ministry audit sample in July was LC50 > 100 % effluent.

The data for two tests of rainbow trout acute lethality conducted on samples of Storm Sewer CW #14 collected between July and December 1990 were provided by Boise Cascade Canada Ltd., Fort Frances. One sample was non-lethal, and one sample was LC50 > 100 % effluent. A Ministry audit sample in July was non-lethal.

The data for two tests of rainbow trout acute lethality conducted on samples of Storm Sewer CW #18 collected between July and December 1990 were provided by Boise Cascade Canada Ltd., Fort Frances. One sample was non-lethal, and one sample was LC50 > 100 % effluent. A Ministry audit sample in July was non-lethal.

Total Mill Final Effluent

12900101 sampled: 07/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NOT LETHAL

01900147 sampled: 07/18/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

12900120 sampled: 08/14/90 LC50: 63.2 %
95% fid. limits: 47.1 - 82.5 % slope: 5.9
comments:

12900135 sampled: 09/10/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900146 sampled: 10/08/90 LC50: 40.8 %
95% fid. limits: 37.6 - 44.2 %
comments:

12900163 sampled: 11/05/90 LC50: 79.7 %
95% fid. limits: 70.8 - 89.5 %
comments:

12900172 sampled: 12/04/90 LC50: 62.2 %
95% fid. limits: 48.9 - 78.9 %
comments:

Wood Storage Drainage

Storm Drainage

Rain Gauge

Intake Water

Storm sewers CW # 14

01900149 sampled: 07/18/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Non-lethal

12900137 sampled: 09/18/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900174 sampled: 12/04/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Storm Sewer CW # 18

01900148 sampled: 07/18/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Non-lethal

12900133 sampled: 09/10/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900173 sampled: 12/04/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Vacuum Seal EffluentP7/S7

Aeration Lagoon P2/S2

COMPANY: Boise Cascade Canada Ltd., Fort Frances (870105)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for five tests of Daphnia magna acute lethality conducted on samples of Total Mill Final Effluent collected between July and December 1990 were provided Boise Cascade Canada Ltd., Fort Frances. One sample was lethal and the LC50 was 73.5 % effluent. Four samples were LC50 > 100 % effluent. A Ministry audit sample in July was LC50 > 100 % effluent.

The data for six tests of Daphnia magna acute lethality conducted on samples of Storm Sewer CW #14 effluent collected between July and December 1990 were provided by Boise Cascade Canada Ltd., Fort Frances. Four samples were non-lethal, and two samples were LC50 > 100 % effluent. A Ministry audit sample in July was non-lethal.

The data for five tests of Daphnia magna acute lethality conducted on samples of Storm Sewer CW #18 effluent collected between July and December 1990 were provided by Boise Cascade Canada Ltd., Fort Frances. Three samples were LC50 > 100 % effluent, and two samples were non-lethal. A Ministry audit sample in July was LC50 > 100 % effluent.

Total Mill Final Effluent

12900108 sampled: 07/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

02900147 sampled: 07/18/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; High conductivity, lo D.O.

12900126 sampled: 08/14/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 % slope: 2.0
comments: CONDUCTIVITY SAMPLE SPILLED ON 48 HR 100%

12900143 sampled: 09/10/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900152 sampled: 10/08/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900167 sampled: 12/04/90 LC50: 73.5 %
95% fid. limits: 65.3 - 82.6 %
comments:

Wood Storage Drainage

Storm Drainage

Rain Gauge

Intake Water

Storm sewers CW # 14

12900107 sampled: 07/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NON-LETHAL

02900149 sampled: 07/18/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Non-lethal

12900127 sampled: 08/14/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

12900138 sampled: 09/18/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

12900153 sampled: 10/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900160 sampled: 11/05/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: OTHER TESTS INVALID DUE TO CONTROL MORTALITY

12900169 sampled: 12/04/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Storm Sewer CW # 18

12900106 sampled: 07/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NON-LETHAL

02900148 sampled: 07/18/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

12900125 sampled: 08/14/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 CALC CORRECTED FOR CONTROL MORTALITY

12900142 sampled: 09/10/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900151 sampled: 10/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900168 sampled: 12/04/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Vacuum Seal EffluentP7/S7

Aeration Lagoon P2/S2

COMPANY: Boise Cascade Canada Ltd., Kenora (870006)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Final Effluent collected between July and December 1990 were provided by Boise Cascade Canada Ltd., Kenora. The samples were lethal, and the LC50s ranged from 4.1 to 5.5 % effluent.

Final Effluent

12900102 sampled: 07/11/90 LC50: 4.1 %
95% fid. limits: 2.6 - 6.3 %
comments:

12900121 sampled: 08/15/90 LC50: 5.5 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900131 sampled: 09/12/90 LC50: 5.5 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900147 sampled: 10/10/90 LC50: 5.5 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900164 sampled: 11/07/90 LC50: 5.5 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900171 sampled: 12/05/90 LC50: 4.1 %
95% fid. limits: 2.6 - 6.3 %
comments:]

East Yard Drainage Ditch

Rain Gauge

Intake Water

COMPANY: Boise Cascade Canada Ltd., Kenora (870006)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Final Effluent collected between July and December 1990 were provided by Boise Cascade Canada Ltd., Kenora. The samples were lethal, and the LC50s ranged from 1.9 to 19.1 % effluent.

Final Effluent

12900109 sampled: 07/11/90 LC50: 16.9 %
95% fid. limits: 12.6 - 22.6 %
comments:

12900128 sampled: 08/15/90 LC50: 19.1 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900139 sampled: 09/12/90 LC50: 17.8 %
95% fid. limits: 13.2 - 23.8 %
comments: DATA CORRECTED FOR 1 CONTROL DEATH

12900154 sampled: 10/10/90 LC50: 9.9 %
95% fid. limits: 7.8 - 12.4 %
comments:

04904878 sampled: 11/07/90 LC50: 1.9 %
95% fid. limits: 1.5 - 2.2 %
comments:

12900166 sampled: 12/05/90 LC50: 0.0 - 6.0 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 LESS THAN 6%

East Yard Drainage Ditch

Rain Gauge

Intake Water

COMPANY: Canadian Pacific Forest Products, Dryden (840108)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of rainbow trout acute lethality were conducted on samples of Final Effluent collected between July and December 1990 were provided by Canadian Pacific Forest Products Ltd., Dryden. Four samples were LC50 > 100 % effluent, and two samples were non-lethal.

Final Effluent

12900100 sampled: 07/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 GREATER THAN 100%

12900119 sampled: 08/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: ONE DEAD FISH IN CONTROL. NO OTHER MORTALITY.

12900132 sampled: 09/10/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900145 sampled: 10/08/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900162 sampled: 11/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NON-LETHAL

12900170 sampled: 12/03/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

Emergency Overflow

Storm Water C3

Storm Water P2

COMPANY: Canadian Pacific Forest Products, Dryden (840108)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for four tests of Daphnia magna acute lethality conducted on samples of Final Effluent collected between July and December 1990 were provided by Canadian Pacific Forest Products Ltd., Dryden. The samples were non-lethal.

Final Effluent

12900105 sampled: 07/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NON-LETHAL

12900124 sampled: 08/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NON-LETHAL

12900150 sampled: 10/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NON-LETHAL

12900165 sampled: 12/03/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Emergency Overflow

Storm Water C3

Storm Water P2

Storm Water P4

Rain Gauge

Intake Water

Cooling Water C1

COMPANY: Canadian Pacific Forest Products, Thunder Bay (840009)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for four tests of rainbow trout acute lethality conducted on samples of Combined Mill Outfall effluent collected between July and December 1990 were provided by Canadian Pacific Forest Products Ltd., Thunder Bay. The samples were lethal, and the LC50s ranged from 17.3 to 50.1 % effluent.

The data for four tests of rainbow trout acute lethality conducted on samples of Clean Water Outfall effluent collected between July and December 1990 were provided by Canadian Pacific Forest Products Ltd., Thunder Bay. Three samples were LC50 > 100 % effluent, and one sample was non-lethal.

Combined Mill Outfall

12900104 sampled: 07/09/90 LC50: 50.1 %
95% fid. limits: 40.6 - 61.8 %
comments:

12900122 sampled: 08/13/90 LC50: 17.3 %
95% fid. limits: 11.6 - 24.8 % slope: 5.5
comments:

12900136 sampled: 09/10/90 LC50: 42.4 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900149 sampled: 10/08/90 LC50: 30.1 %
95% fid. limits: 21.1 - 42.9 %
comments:

Clean Water Outfall

12900103 sampled: 07/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 GREATER THAN 100%

12900123 sampled: 08/13/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900134 sampled: 09/10/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900148 sampled: 10/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NON LETHAL

Bark Storage

Chip Storage

Wood Storage

Coal Storage

Waste Disposal Site

Backwash Effluent

Rain Gauge

Intake Water

Acid Sewer P2

Alkaline Sewer P3

Neutral Fibre Sewer P4

Newsmill Effluent

Waste Disposal Site

Wetwell

Outfall 3

COMPANY: Canadian Pacific Forest Products, Thunder Bay (640009)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY

The data for four tests of Daphnia magna acute lethality conducted on samples of Combined Mill Outfall effluent collected between July and December 1990 were provided by Canadian Pacific Forest Products Ltd., Thunder Bay. Two samples were LC50 > 100 % effluent. Two samples were lethal, and the LC50s were 68.0 and 69.9 % effluent.

The data for four tests of Daphnia magna acute lethality conducted on samples of Clean Water Outfall effluent collected between July and December 1990 were provided by Canadian Pacific Forest Products Ltd., Thunder Bay. The samples were lethal, and the LC50s ranged from 36.1 to 68.0 % effluent.

Combined Mill Outfall

12900111 sampled: 07/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 GREATER THAN 100%

12900130 sampled: 08/13/90 LC50: 68.0 %
95% fid. limits: 62.7 - 73.8 %
comments:

12900141 sampled: 09/10/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900156 sampled: 10/08/90 LC50: 69.9 %
95% fid. limits: 0.0 - 0.0 %
comments:

Clean Water Outfall

12900110 sampled: 07/09/90 LC50: 54.6 %
95% fid. limits: 41.9 - 71.2 %
comments:

12900129 sampled: 08/13/90 LC50: 68.0 %
95% fid. limits: 62.7 - 73.8 %
comments:

12900140 sampled: 09/10/90 LC50: 40.5 %
95% fid. limits: 33.1 - 49.4 %
comments: DATA CORRECTED FOR 1 CONTROL DEATH

12900155 sampled: 10/08/90 LC50: 36.1 %
95% fid. limits: 0.0 - 0.0 %
comments:

Bark Storage

Chip Storage

Wood Storage

Coal Storage

Waste Disposal Site

Backwash Effluent

Rain Gauge

Intake Water

Acid Sewer P2

Alkaline Sewer P3

Neutral Fibre Sewer P4

Newsmill Effluent

Waste Disposal Site

Wetwell

Outfall 3

COMPANY: Domtar Inc., Cornwall
(140301)
(now with Fine Papers Division)
SECTOR: pulp and paper
REGION: Southeast

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Total Mill Effluent collected between July and December 1990 were provided by Domtar Inc., Cornwall. Two samples were lethal, and the LC50s were 66.1 and 57.0 % effluent. Two samples were LC50 > 100 % effluent, and two samples were non-lethal.

Total Mill Effluent

13900026 sampled: 07/11/90 LC50: 66.1 %
95% fid. limits: 57.4 - 75.3 %
comments: 29

13900032 sampled: 08/15/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

13900034 sampled: 09/12/90 LC50: 57.0 %
95% fid. limits: 50.0 - 65.0 %
comments:

13900039 sampled: 10/10/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

13900044 sampled: 11/14/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

13900047 sampled: 12/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Clarifier Effluent

By-Pass Sewer

COMPANY: Domtar Inc., Cornwall
(140301)
(now with Fine Papers Division)
SECTOR: pulp and paper
REGION: Southeast

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Total Mill Effluent collected between July and December 1990 were provided by Domtar Inc., Cornwall. Two samples were LC50 > 100 % effluent, and four samples were non-lethal.

Total Mill Effluent

13900026 sampled: 07/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

13900032 sampled: 08/15/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

13900034 sampled: 09/12/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

13900039 sampled: 10/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

13900044 sampled: 11/14/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

13900047 sampled: 12/12/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

Clarifier Effluent

By-Pass Sewer

Diversion Manhole

COMPANY: Domtar Inc., Red Rock
(140202)
(now with Containerboard Division)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Total Mill Outfall Stream effluent between July and December 1990 were provided by Domtar Inc., Red Rock. The samples were lethal, and the LC50s ranged from 67.7 to 84.4 % effluent.

Total Mill Outfall Stream

13900027 sampled: 07/10/90 LC50: 70.7 %
95% fid. limits: 50.0 - 100.0 %
comments:

13900030 sampled: 08/14/90 LC50: 77.0 %
95% fid. limits: 65.0 - 100.0 %
comments:

13900035 sampled: 09/11/90 LC50: 77.0 %
95% fid. limits: 65.0 - 100.0 %
comments:

13900037 sampled: 10/09/90 LC50: 70.5 %
95% fid. limits: 65.0 - 80.0 %
comments:

13900043 sampled: 11/13/90 LC50: 84.4 %
95% fid. limits: 65.0 - 100.0 %
comments:

13900046 sampled: 12/11/90 LC50: 67.7 %
95% fid. limits: 60.9 - 73.9 % slope: 18.8
comments:

Storm Drainage Stream

Rain Gauge

Intake Water

COMPANY: Domtar Inc., Red Rock
(140202)
(now with Containerboard Division)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Total Mill Outfall Stream effluent collected between July and December 1990 were provided by Domtar Inc., Red Rock. Three samples were LC50 > 100 % effluent, and two samples were non-lethal. One sample was lethal, and the LC50 was 58.2 % effluent.

Total Mill Outfall Stream

13900027 sampled: 07/10/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

13900030 sampled: 08/14/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

13900035 sampled: 09/11/90 LC50: 58.2 %
95% fid. limits: 50.0 - 65.0 %
comments:

13900037 sampled: 10/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

13900043 sampled: 11/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

13900046 sampled: 12/11/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

Storm Drainage Stream

Rain Gauge

COMPANY: Domtar Inc., St. Catharines
(140509)
(now with Fine Paper Division)
SECTOR: pulp and paper
REGION: West Central

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Clarifier Outlet effluent collected between July and December 1990 were provided by Domtar Inc., St. Catharines. Three samples were non-lethal, and two samples were LC50 > 100 % effluent. One sample was lethal, and the LC50 was 87.7 % effluent.

Clarifier Outlet

13900028 sampled: 07/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

13900031 sampled: 08/14/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

13900036 sampled: 09/11/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

13900038 sampled: 10/09/90 LC50: 87.7 %
95% fid. limits: 80.0 - 100.0 %
comments:

13900042 sampled: 11/13/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

13900048 sampled: 12/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Inatke Water

Emergency Overflow

COMPANY: Domtar Inc., St. Catharines
(140509)
(now with Fine Paper Division)
SECTOR: pulp and paper
REGION: West Central

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Clarifier Outlet effluent collected between July and December 1990 were provided by Domtar Inc., St. Catharines. Four samples were non-lethal, and one sample was LC50 > 100 % effluent. One sample was lethal, and the LC50s was 92.0 % effluent.

Clarifier Outlet

13900028 sampled: 07/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

13900031 sampled: 08/14/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

13900036 sampled: 09/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

13900038 sampled: 10/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

13900042 sampled: 11/13/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

13900048 sampled: 12/12/90 LC50: 92.0 %
95% fid. limits: 84.1 - 106.4 % slope: 13.9
comments:

Inatke Water

Emergency Overflow

COMPANY: Domtar Inc., Trenton
(140608)
(now with Containerboard Division)
SECTOR: pulp and paper
REGION: Southeast

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Mill Combined Effluent collected between July and December 1990 were provided by Domtar Inc., Trenton. The samples were lethal, and the LC50s ranged from 24.5 to 43.2 % effluent.

Mill Combined Effluent

13900025 sampled: 07/10/90 LC50: 34.6 %
95% fid. limits: 30.0 - 40.0 %
comments:

13900029 sampled: 08/14/90 LC50: 30.0 %
95% fid. limits: 20.0 - 40.0 %
comments:

13900033 sampled: 09/11/90 LC50: 27.3 %
95% fid. limits: 20.0 - 30.0 %
comments:

13900040 sampled: 10/16/90 LC50: 33.0 %
95% fid. limits: 30.0 - 40.0 %
comments:

13900041 sampled: 11/13/90 LC50: 24.5 %
95% fid. limits: 20.0 - 30.0 %
comments:

13900045 sampled: 12/11/90 LC50: 43.2 %
95% fid. limits: 39.4 - 47.3 %
comments:

South Drainage Ditch STP1

Boat Ramp STC2

North Storm Pipe STP6

COMPANY: Domtar Inc., Trenton
(140608)
(now with Containerboard Division)
SECTOR: pulp and paper
REGION: Southeast

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Mill Combined Effluent collected between July and December 1990 were provided by Domtar Inc., Trenton. Four samples were lethal, and the LC50s ranged from 51.1 to 83.1 % effluent. One sample was non-lethal, and one sample was LC50 > 100 % effluent.

Mill Combined Effluent

13900025 sampled: 07/10/90 LC50: 51.1 %
95% fid. limits: 42.2 - 66.7 %
comments:

13900029 sampled: 08/14/90 LC50: 70.7 %
95% fid. limits: 50.0 - 100.0 %
comments:

13900033 sampled: 09/11/90 LC50: 66.3 %
95% fid. limits: 50.0 - 100.0 %
comments:

13900040 sampled: 10/16/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

13900041 sampled: 11/13/90 LC50: 83.1 %
95% fid. limits: 65.0 - 100.0 %
comments:

13900045 sampled: 12/11/90 LC50: 121.0 %
95% fid. limits: 83.0 - ***.* % slope: 3.1
comments:

South Drainage Ditch STP1

Boat Ramp STC2

COMPANY: E.B. Eddy Forest Products Ltd., Ottawa (980201)
SECTOR: pulp and paper
REGION: Southeast

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Effluent Discharge collected between July and December 1990 were provided by E.B. Eddy Forest Products Ltd., Ottawa. Three samples were non-lethal, and one sample was LC50 > 100 % effluent. Two samples were lethal, and the LC50s were 77.9 and 74.9 % effluent.

Effluent Discharge

06900836 sampled: 07/03/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901118 sampled: 08/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901318 sampled: 09/05/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN FULL STRENGTH EFFLUENT.

06901506 sampled: 10/01/90 LC50: 77.9 %
95% fid. limits: 72.9 - 83.2 %
comments: 10% MORTALITY IN 65% TEST CONCENTRATION.

06901845 sampled: 11/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06902124 sampled: 12/12/90 LC50: 74.9 %
95% fid. limits: 66.2 - 88.3 %
comments: COMPLETE MORTALITY IN 100% TEST CONCENTRATION

Intake Water

Emergency Overflows

COMPANY: E.B. Eddy Forest Products Ltd., Ottawa (980201)
SECTOR: pulp and paper
REGION: Southeast

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Effluent Discharge collected between July and December 1990 were provided by E.B. Eddy Forest Products Ltd., Ottawa. Four samples were lethal, and the LC50s ranged from 35.3 to 80.6 % effluent. Two samples were non-lethal.

Effluent Discharge

06900835 sampled: 07/03/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901119 sampled: 08/07/90 LC50: 80.6 %
95% fid. limits: 65.0 - 100.0 %
comments: COMPLETE MORTALITY IN 100% CONCENTRATION

06901319 sampled: 09/05/90 LC50: 75.2 %
95% fid. limits: 68.9 - 82.1 %
comments: COMPLETE MORTALITY IN FULL STRENGTH EFFLUENT.

06901507 sampled: 10/01/90 LC50: 38.7 %
95% fid. limits: 30.0 - 50.0 %
comments: COMPLETE MORTALITY IN 50% TEST CONCENTRATION.

06901846 sampled: 11/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED

06902125 sampled: 12/12/90 LC50: 35.3 %
95% fid. limits: 31.5 - 39.7 %
comments: 20% MORTALITY IN 30% TEST CONCENTRATION.

Intake Water

Emergency Overflows

COMPANY: E.B.Eddy Forest Products Ltd., Espanola (980003)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY
The data for two tests of rainbow trout acute lethality conducted on samples of Main Mill Sewer effluent collected between July and December 1990 were provided by E.B. Eddy Forest Products Ltd., Espanola. The samples were non-lethal.

The data for two tests of rainbow trout acute lethality conducted on samples of Hot Water Tank effluent collected between July and December 1990 were provided by E.B. Eddy Forest Products Ltd., Espanola. One sample was non-lethal, and one sample was LC50 > 100 % effluent.

Main Mill Sewer

06901120 sampled: 08/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901833 sampled: 11/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Hot Water Tank

06901186 sampled: 08/15/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN 100% CONCENTRATION.

06901882 sampled: 11/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Power Canal

Woodroom

Filter Backwash

COMPANY: E.B.Eddy Forest Products Ltd., Espanola (980003)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Main Mill Sewer effluent collected between July and December 1990 were provided by E.B. Eddy Forest Products Ltd., Espanola. The samples were non-lethal.

The data for six tests of Daphnia magna acute lethality conducted on samples of Hot Water Tank effluent collected between July and December 1990 were provided by E.B. Eddy Forest Products Ltd., Espanola. The samples were non-lethal.

Main Mill Sewer

06900904 sampled: 07/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901121 sampled: 08/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901445 sampled: 09/17/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901520 sampled: 10/01/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901834 sampled: 11/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED

06902051 sampled: 12/03/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Hot Water Tank

06901024 sampled: 07/31/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901187 sampled: 08/15/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901446 sampled: 09/17/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901775 sampled: 10/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901883 sampled: 11/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED

06902132 sampled: 12/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Power Canal

Woodroom

Filter Backwash

Rain Gauge

Intake Water

COMPANY: James River Marathon Ltd., Marathon (850008)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Final Effluent PE1 collected between July and Decemeber 1990 were provided by James River-Marathon Ltd., Marathon. The samples were lethal, and the LC50s ranged from 14.1 to 77.0 % effluent.

The data for two tests of rainbow trout acute lethality conducted on samples of Evaps Cooling Water CW1 effluent collected between July and December 1990 were provided by James River-Marathon Ltd., Marathon. The samples were non-lethal.

The data for two tests of rainbow trout acute lethality conducted on samples of Hypo Cooling Water CW1 effluent collected between July and December 1990 were provided by James River-Marathon Ltd., Marathon. The samples were non-lethal.

Final Effluent PE1

04902121 sampled: 07/02/90 LC50: 24.5 %
95% fid. limits: 0.0 - 0.0 %
comments:

04903060 sampled: 08/13/90 LC50: 24.5 %
95% fid. limits: 0.0 - 0.0 %
comments:

04903567 sampled: 09/05/90 LC50: 14.1 %
95% fid. limits: 0.0 - 0.0 %
comments:

04904166 sampled: 10/01/90 LC50: 14.1 %
95% fid. limits: 0.0 - 0.0 %
comments:

04904882 sampled: 11/05/90 LC50: 47.2 %
95% fid. limits: 42.7 - 52.0 %
comments:

04905371 sampled: 12/03/90 LC50: 77.0 %
95% fid. limits: 70.6 - 84.0 %
comments:

Evaps Cooling Water CW1

04903588 sampled: 09/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

04905579 sampled: 12/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

Hypo Cooling Water CW1

04903587 sampled: 09/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

04905580 sampled: 12/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Storm Water # 1

Storm Water # 2

Storm Water # 3

Storm Water # 4

Storm Water # 5

Rain Gauge

Intake Water

Main Mill Portion

Acid Effluent Portion

COMPANY: James River Marathon Ltd., Marathon (850008)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Final Effluent PE1 collected between July and December 1990 were provided by James River-Marathon Ltd., Marathon. The samples were lethal, and the LC50s ranged from 11.9 to 69.4 % effluent.

The data for six tests of Daphnia magna acute lethality conducted on samples of Evaps Cooling Water CW1 effluent collected between July and December 1990 were provided by James River-Marathon Ltd., Marathon. One sample was LC50 > 100 % effluent. Five samples were non-lethal.

The data for six tests of Daphnia magna acute lethality conducted on samples of Hypo Cooling Water CW1 effluent collected between July and December 1990 were provided by James River-Marathon Ltd., Marathon. One sample was lethal, and the LC50 was 66.0 % effluent. Five samples were non-lethal.

Final Effluent PE1

04902121 sampled: 07/02/90 LC50: 16.2 %
95% fid. limits: 14.1 - 18.6 %
comments:

04903060 sampled: 08/13/90 LC50: 22.4 %
95% fid. limits: 0.0 - 0.0 %
comments:

04903567 sampled: 09/05/90 LC50: 11.9 %
95% fid. limits: 0.0 - 0.0 %
comments:

04904166 sampled: 10/01/90 LC50: 11.9 %
95% fid. limits: 0.0 - 0.0 %
comments:

04904882 sampled: 11/05/90 LC50: 69.4 %
95% fid. limits: 59.6 - 80.6 %
comments:

04905371 sampled: 12/03/90 LC50: 36.5 %
95% fid. limits: 28.6 - 46.5 %
comments:

Evaps Cooling Water CW1

04902203 sampled: 07/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non-lethal

04903192 sampled: 08/20/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 48 hr LC50 > 100%

04903588 sampled: 09/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

04904282 sampled: 10/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

04905001 sampled: 11/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non-lethal

04905579 sampled: 12/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Hypo Cooling Water CW1

04902202 sampled: 07/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non-lethal

04903191 sampled: 08/20/90 LC50: 66.0 %
95% fid. limits: 55.2 - 78.8 %
comments:

04903587 sampled: 09/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

04904281 sampled: 10/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

04905000 sampled: 11/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non-lethal

04905580 sampled: 12/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Storm Water # 1

Storm Water # 2

Storm Water # 3

Storm Water # 4

Storm Water # 5

Rain Gauge

Intake Water

Main Mill Portion

Acid Effluent Portion

COMPANY: Kimberly-Clark of Canada Limited, Huntsville (830109)
SECTOR: pulp and paper
REGION: Central

SUMMARY
The data for two tests of rainbow trout acute lethality conducted on samples of Effluent Discharge collected between July and December 1990 were provided by Kimberly-Clark Canada Ltd., Huntsville. The samples were non-lethal. Two Ministry audit samples in August and December were non-lethal.

Effluent Discharge

01900178 sampled: 08/22/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Non-lethal

03900972 sampled: 11/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

01900272 sampled: 12/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

03901077 sampled: 12/17/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

Storm Water Drainage

Rain Gauge

Intake Water

COMPANY: Kimberly-Clark of Canada Limited, Huntsville (830109)
SECTOR: pulp and paper
REGION: Central

SUMMARY
The data for two tests of Daphnia magna acute lethality conducted on samples of Effluent Discharge collected between July and December 1990 were provided by Kimberly-Clark Canada Ltd., Huntsville. One sample was non-lethal, and one sample was LC50 > 100 % effluent. Two Ministry audit samples in August and December were non-lethal and LC50 > 100 % effluent.

Effluent Discharge

02900178 sampled: 08/22/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

03900972 sampled: 11/12/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

02900272 sampled: 12/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

03901065 sampled: 12/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

Storm Water Drainage

Rain Gauge

Intake Water

COMPANY: Kimberly-Clark of Canada Limited, St. Catharines (830208)
SECTOR: pulp and paper
REGION: West Central

SUMMARY
The data for two tests of rainbow trout acute lethality conducted on samples of Final Effluent collected between July and December 1990 were provided by Kimberly-Clark Canada Ltd., St. Catharines. One sample was non-lethal, and one sample was LC50 > 100 % effluent. A Ministry audit sample in August was non-lethal.

Final Effluent

01900187 sampled: 08/28/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Non-lethal

03900831 sampled: 09/20/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: Each conc.=22L volume

03901082 sampled: 12/20/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

Intake Water

Emergency Overflow

COMPANY: Kimberly-Clark of Canada Limited, St. Catharines (830208)
SECTOR: pulp and paper
REGION: West Central

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Final Effluent collected between July and December 1990 were provided by Kimberly-Clark Canada Ltd., St. Catharines. Five samples were non-lethal, and one sample was LC50 > 100 % effluent. A Ministry audit sample in August was non-lethal.

Final Effluent

03900615 sampled: 07/19/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

03900730 sampled: 08/23/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

02900187 sampled: 08/28/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

03900831 sampled: 09/20/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non lethal

03900915 sampled: 10/18/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non Lethal

03901016 sampled: 11/22/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

03901082 sampled: 12/20/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

COMPANY: Kimberly-Clark of Canada Ltd., Terrace Bay (830000)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Combined Effluent KCS1 collected between July and December 1990 were provided by Kimberly-Clark Canada Ltd., Terrace Bay. The samples were non-lethal. A Ministry audit sample in July was non-lethal.

The data for six tests of rainbow trout acute lethality conducted on samples of Cooling Water effluent collected between July and December 1990 were provided by Kimberly-Clark Canada Ltd., Terrace Bay. The samples were non-lethal. A Ministry audit sample in July was non-lethal.

Combined Effluent KCS1

01900136 sampled: 07/04/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Non-lethal

10900329 sampled: 07/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900381 sampled: 08/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900418 sampled: 09/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900471 sampled: 10/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900537 sampled: 11/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900579 sampled: 12/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Storm Sewer-Bark PileKCP3

Storm Sewer-Bulk KCP4

Storm Sewer Chip PileKCC1

Rain Gauge

Intake Water

Emergency Overflow KCS3

cooling water

01900137 sampled: 07/04/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Non-lethal

10900350 sampled: 07/24/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900394 sampled: 08/19/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900440 sampled: 09/23/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900478 sampled: 10/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900548 sampled: 11/25/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900577 sampled: 12/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

COMPANY: Kimberly-Clark of Canada Ltd., Terrace Bay (830000)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Combined Effluent KCS1 collected between July and December 1990 were provided by Kimberly-Clark Canada Ltd., Terrace Bay. Five samples were non-lethal, and one sample was LC50 > 100 % effluent. A Ministry audit sample in July was non-lethal.

The data for six tests of Daphnia magna acute lethality conducted on samples of Cooling Water effluent collected between July and December 1990 were provided by Kimberly-Clark Canada Ltd., Terrace Bay. Two samples were lethal, and the LC50s were 70.8 and 85.2 % effluent. Three samples were LC50 > 100 % effluent, and one sample was non-lethal. A Ministry audit sample in July was LC50 > 100 % effluent.

Combined Effluent KCS1

02900136 sampled: 07/04/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; High Conductivity

10900329 sampled: 07/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900381 sampled: 08/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900418 sampled: 09/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900471 sampled: 10/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900537 sampled: 11/11/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

10900579 sampled: 12/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Storm Sewer-Bark PileKCP3

Storm Sewer-Bulk KCP4

Storm Sewer Chip PileKCC1

Rain Gauge

Intake Water

Emergency Overflow KCS3

cooling water

02900137 sampled: 07/04/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

10900350 sampled: 07/24/90 LC50: 85.2 %
95% fid. limits: 66.8 - 140.4 % slope: 4.3
comments:

10900394 sampled: 08/19/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900440 sampled: 09/23/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

10900478 sampled: 10/09/90 LC50: 70.8 %
95% fid. limits: 63.1 - 79.3 %
comments:

10900548 sampled: 11/25/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

10900577 sampled: 12/08/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

COMPANY: Macmillan-Bloedel Limited, Sturgeon Falls (1530005)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY

Clean Sewer Effluent P-1

Treated Effluent P-2

Intake Water

COMPANY: Macmillan-Bloedel Limited, Sturgeon Falls (1530005)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY

Clean Sewer Effluent P-1

Treated Effluent P-2

Intake Water

COMPANY: Malette Inc., Smooth Rock Falls
(860502)
(now with Pulp and Power Division)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Final Effluent collected between July and December 1990 were provided by Malette Inc., Smooth Rock Falls. Four samples were lethal, and the LC50s ranged from 6.7 to 95 % effluent. One sample was non-lethal, and one sample was LC50 > 100 % effluent. A Ministry audit sample in August was non-lethal. A Ministry audit sample in August of Cooling Water effluent was non-lethal. Two samples of New Turbine Cooling Water effluent were non-lethal.

Cooling water

01900183 sampled: 08/27/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Non-lethal

Final Effluent

06900902 sampled: 07/09/90 LC50: 95.0 %
95% fid. limits: 0.0 - 0.0 %
comments: CONFIDENCE LIMITS CAN NOT BE CALCULATED

06901157 sampled: 08/13/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 ESTIMATED BY GRAPHICAL EXTRAPOLATION.

01900184 sampled: 08/27/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

06901410 sampled: 09/10/90 LC50: 80.6 %
95% fid. limits: 65.0 - 100.0 %
comments: 100% MORTALITY IN FULL STRENGTH EFFLUENT

06901628 sampled: 10/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901886 sampled: 11/12/90 LC50: 24.5 %
95% fid. limits: 20.0 - 30.0 %
comments: COMPLETE MORTALITY IN 30% TEST CONCENTRATION

06902128 sampled: 12/12/90 LC50: 6.7 %
95% fid. limits: 5.9 - 7.5 %
comments: COMPLETE MORTALITY IN 10% TEST CONCENTRATION

New Turbine Cooling Water

06901776 sampled: 10/29/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901999 sampled: 11/27/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Rain Gauge

Intake Water

Storm Water #1

Storm Water #2

Storm Water #3

COMPANY: Malette Inc., Smooth Rock Falls (860502)
(now with Pulp and Power Division)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Final Effluent collected between July and December 1990 were provided by Malette Inc., Smooth Rock Falls. Four samples were lethal, and the LC50s ranged from 24.5 to 90.2 % effluent. Two samples were LC50 > 100 % effluent. A Ministry audit sample in August was LC50 > 100 % effluent. A Ministry audit sample in August of Cooling Water effluent was non-lethal. Two samples of New Turbine Cooling Water were non-lethal.

Cooling water

02900183 sampled: 08/27/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

Final Effluent

06900903 sampled: 07/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 20% MORTALITY IN FULL STRENGTH EFFLUENT

06901158 sampled: 08/13/90 LC50: 54.7 %
95% fid. limits: 39.0 - 90.4 % slope: 2.5
comments: 40% MORTALITY IN 50% TEST CONCENTRATION.

02900184 sampled: 08/27/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA audit sample.

06901411 sampled: 09/10/90 LC50: 90.2 %
95% fid. limits: 65.0 - 100.0 %
comments: 60% MORTALITY IN 100% TEST CONCENTRATION.

06901629 sampled: 10/08/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 20% MORTALITY IN FULL STRENGTH EFFLUENT

06901887 sampled: 11/12/90 LC50: 24.5 %
95% fid. limits: 20.0 - 30.0 %
comments: COMPLETE MORTALITY IN 30% TEST CONCENTRATION.

06902129 sampled: 12/12/90 LC50: 33.9 %
95% fid. limits: 30.0 - 38.3 %
comments: 50% MORTALITY IN 30% TEST CONCENTRATION.

New Turbine Cooling Water

06901777 sampled: 10/29/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901998 sampled: 11/27/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Rain Gauge

Intake Water

Storm Water #1

Storm Water #2

Storm Water #3

COMPANY: Noranda Forest Inc., Thorold (940007)
SECTOR: pulp and paper
REGION: West Central

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Circular Clarifier effluent collected between July and December 1990 were provided by Noranda Forest Inc., Thorold. The samples were lethal, and the LC50s ranged from 1.4 to 25.6 % effluent. A Ministry audit sample in August was lethal, and the LC50 was 55.9 % effluent.

Circular Clarifier

06900909 sampled: 07/11/90 LC50: 7.1 %
95% fid. limits: 5.0 - 10.0 %
comments: 100% MORTALITY IN 10% TEST CONCENTRATION

06901122 sampled: 08/07/90 LC50: 16.7 %
95% fid. limits: 14.2 - 19.5 %
comments: 70% MORTALITY IN 20% TEST CONCENTRATION.

01900177 sampled: 08/20/90 LC50: 55.9 %
95% fid. limits: 49.8 - 62.8 %
comments: MISA Audit

06901312 sampled: 09/04/90 LC50: 25.6 %
95% fid. limits: 23.5 - 27.9 %
comments: 90% MORTALITY IN 30% TEST CONCENTRATION.

06901512 sampled: 10/02/90 LC50: 1.5 %
95% fid. limits: 1.3 - 1.7 %
comments: 90% MORTALITY IN 2% TEST CONCENTRATION.

06901837 sampled: 11/06/90 LC50: 3.9 %
95% fid. limits: 3.0 - 5.0 %
comments: 100% MORTALITY IN THE 5% CONCENTRATION

06902046 sampled: 12/04/90 LC50: 1.4 %
95% fid. limits: 1.0 - 2.0 %
comments: COMPLETE MORTALITY IN 2% TEST CONCENTRATION.

COMPANY: Noranda Forest Inc., Thorold (940007)
SECTOR: pulp and paper
REGION: West Central

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Circular Clarifier effluent collected between July and December 1990 were provided by Noranda Forest Inc., Thorold. The samples were lethal, and the LC50s ranged from 0.7 to 29.5 % effluent. A Ministry audit sample in August was lethal, and the LC50 was 39.1 % effluent.

Circular Clarifier

06900910 sampled: 07/11/90 LC50: 7.1 %
95% fid. limits: 5.0 - 10.0 %
comments: 100% MORTALITY IN 10% TEST CONCENTRATION.

06901123 sampled: 08/07/90 LC50: 29.5 %
95% fid. limits: 24.2 - 37.4 %
comments: 100% MORTALITY IN 50% TEST CONCENTRATION

02900177 sampled: 08/20/90 LC50: 39.1 %
95% fid. limits: 31.8 - 48.0 %
comments: MISA Audit

06901313 sampled: 09/04/90 LC50: 13.1 %
95% fid. limits: 10.0 - 16.6 % slope: 7.4
comments: 90% MORTALITY IN 20% TEST CONCENTRATION.

06901513 sampled: 10/02/90 LC50: 0.8 %
95% fid. limits: 0.6 - 0.9 %
comments: 90% MORTALITY IN 1% TEST CONCENTRATION.

06901838 sampled: 11/06/90 LC50: 1.7 %
95% fid. limits: 1.0 - 3.0 %
comments: 100% MORTALITY IN THE 3% CONCENTRATION

06902047 sampled: 12/04/90 LC50: 0.7 %
95% fid. limits: 0.5 - 0.7 %
comments: COMPLETE MORTALITY IN 1% TEST CONCENTRATION.

Intake Water

COMPANY: Quebec and Ontario Paper Co. Ltd., Thorold (930008)
SECTOR: pulp and paper
REGION: West Central

SUMMARY
The data for one test of rainbow trout acute lethality conducted on a sample of Final Mill Effluent collected between July and December 1990 were provided by Quebec and Ontario Paper Co. Ltd., Thorold. The sample was non-lethal.

Final Mill effluent

06902156 sampled: 12/30/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Intake Water

COMPANY: Quebec and Ontario Paper Co. Ltd., Thorold (930008)
SECTOR: pulp and paper
REGION: West Central

SUMMARY
The data for two tests of Daphnia magna acute lethality conducted on samples of Final Mill Effluent collected between July and December 1990 were provided by Quebec and Ontario Paper Co. Ltd., Thorold. The samples were non-lethal.

Final Mill effluent

06900914 sampled: 07/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06902157 sampled: 12/30/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Intake Water

COMPANY: Roman Corporation Limited, Strathcona (1740000)
SECTOR: pulp and paper
REGION: Southeast

SUMMARY
The data for five tests of rainbow trout acute lethality conducted on samples of Lagoon #7 To River effluent collected between July and December 1990 were provided by Roman Corp. Ltd., Strathcona. Four samples were non-lethal. One sample was lethal, and the LC50 was 80.6 % effluent.

The data for four tests of rainbow trout acute lethality conducted on samples of Raw Water Drain effluent collected between July and December 1990 were provided by Roman Corp. Ltd., Strathcona. The samples were non-lethal.

The data for five tests of rainbow trout acute lethality conducted on samples of Boiler Water Drain effluent collected between July and December 1990 were provided by Roman Corp. Ltd., Strathcona. Four samples were non-lethal. One sample was lethal, and the LC50 was 75.2 % effluent.

Lagoon #7 to River

06900900 sampled: 07/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901412 sampled: 09/11/90 LC50: 80.6 %
95% fid. limits: 65.0 - 100.0 %
comments: COMPLETE MORTALITY IN 100% TEST CONCENTRATION

06901595 sampled: 10/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901888 sampled: 11/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06902044 sampled: 12/04/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Raw Water Drain

06901450 sampled: 09/18/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901679 sampled: 10/16/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901965 sampled: 11/20/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06902122 sampled: 12/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Boiler Water Drain

06901019 sampled: 07/24/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901499 sampled: 09/25/90 LC50: 75.2 %
95% fid. limits: 68.9 - 82.1 %
comments: 20% MORTALITY IN 65% TEST CONCENTRATION.

06901765 sampled: 10/23/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901993 sampled: 11/27/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06902146 sampled: 12/18/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Intake Water

COMPANY: Roman Corporation Limited, Strathcona (1740000)
SECTOR: pulp and paper
REGION: Southeast

SUMMARY

The data for six tests of Daphnia magna acute lethality conducted on samples of Lagoon #7 To River effluent collected between July and December 1990 were provided by Roman Corp. Ltd., Strathcona. Five samples were non-lethal, and one sample was LC50 > 100 % effluent.

The data for six tests of Daphnia magna acute lethality conducted on samples of Raw Water Drain effluent collected between July and December 1990 were provided by Roman Corp. Ltd., Strathcona. Four samples were non-lethal. Two samples were lethal, and the LC50s were 20.2 and 80.6 % effluent.

The data for six tests of Daphnia magna acute lethality conducted on samples of Boiler Water Drain effluent collected between July and December 1990 were provided by Roman Corp. Ltd., Strathcona. One sample was lethal, and the LC50 was 50.5 % effluent. Four samples were non-lethal, and one sample was LC50 > 100 % effluent.

Lagoon #7 to River

06900901 sampled: 07/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901164 sampled: 08/14/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901413 sampled: 09/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901596 sampled: 10/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901889 sampled: 11/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06902045 sampled: 12/04/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Raw Water Drain

06900954 sampled: 07/17/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901230 sampled: 08/21/90 LC50: 80.6 %
95% fid. limits: 65.0 - 100.0 %
comments: COMPLETE MORTALITY IN 100% TEST CONCENTRATION

06901451 sampled: 09/18/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901680 sampled: 10/16/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901966 sampled: 11/20/90 LC50: 20.2 %
95% fid. limits: 13.8 - 26.5 % slope: 3.7
comments: 70% MORTALITY IN 20% TEST CONCENTRATION.

06902123 sampled: 12/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Boiler Water Drain

06901020 sampled: 07/24/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901300 sampled: 08/28/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901500 sampled: 09/25/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 50% MORTALITY IN 100% TEST CONCENTRATION.

06901766 sampled: 10/23/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901992 sampled: 11/27/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06902147 sampled: 12/18/90 LC50: 50.5 %
95% fid. limits: 42.3 - 61.4 %
comments: 20% MORTALITY IN 30% TEST CONCENTRATION.

Intake Water

COMPANY: Spruce Falls Power and Paper Co.Ltd, Kapuskasing (1340009)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Mill Main Sewer effluent collected between July and December 1990 were provided by Spruce Falls Power and Paper Co. Ltd., Kapuskasing. The samples were lethal, and the LC50s ranged from 12.3 to 46.7 % effluent.

Mill Main Sewer

03900572 sampled: 07/08/90 LC50: 46.7 %
95% fid. limits: 35.6 - 61.1 % slope: 6.0
comments: Lethal

03900671 sampled: 08/13/90 LC50: 46.7 %
95% fid. limits: 35.6 - 61.1 % slope: 6.0
comments:

03900781 sampled: 09/09/90 LC50: 28.3 %
95% fid. limits: 20.0 - 40.0 %
comments:

03900889 sampled: 10/08/90 LC50: 12.3 %
95% fid. limits: 8.3 - 18.1 % slope: 4.6
comments:

03900973 sampled: 11/11/90 LC50: 14.1 %
95% fid. limits: 10.0 - 20.0 %
comments:

03901064 sampled: 12/10/90 LC50: 13.4 %
95% fid. limits: 9.9 - 18.1 % slope: 4.2
comments:

Storm Water SW1

Storm Water SW2

Storm Water SW3

COMPANY: Spruce Falls Power and Paper Co.Ltd, Kapuskasing (1340009)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Mill Main Sewer effluent collected between July and December 1990 were provided by Spruce Falls Power and Paper Co. Ltd., Kapuskasing. The samples were lethal, and the LC50s ranged from 18.0 to 100 % effluent.

Mill Main Sewer

03900572 sampled: 07/08/90 LC50: 50.0 - 100.0 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 Range 50 - 100

03900671 sampled: 08/13/90 LC50: 63.7 %
95% fid. limits: 48.5 - 83.4 % slope: 5.6
comments:

03900781 sampled: 09/09/90 LC50: 61.4 %
95% fid. limits: 48.0 - 78.5 % slope: 5.8
comments:

03900889 sampled: 10/08/90 LC50: 35.4 %
95% fid. limits: 25.0 - 50.0 %
comments:

03900973 sampled: 11/11/90 LC50: 31.9 %
95% fid. limits: 24.5 - 41.3 % slope: 6.0
comments:

03901064 sampled: 12/10/90 LC50: 18.0 %
95% fid. limits: 13.0 - 25.0 %
comments:

Storm Water SW1

Storm Water SW2

Storm Water SW3

COMPANY: St. Marys Paper Inc., Sault Ste. Marie (860304)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Clear To River effluent collected between July and December 1990 were provided by St. Mary's Paper Inc., Sault Ste. Marie. The samples were lethal, and the LC50s ranged from 14.1 to 80.6 % effluent. A Ministry audit sample in September was lethal, and the LC50 was 64.9 % effluent.

Clear to River

06900960 sampled: 07/18/90 LC50: 80.6 %
95% fid. limits: 65.0 - 100.0 %
comments: 100% MORTALITY IN THE 100% CONCENTRATION

06901167 sampled: 08/15/90 LC50: 70.2 %
95% fid. limits: 63.0 - 78.1 %
comments: 40% MORTALITY IN 65% TEST CONCENTRATION.

06901414 sampled: 09/12/90 LC50: 17.6 %
95% fid. limits: 14.8 - 20.8 %
comments: 60% MORTALITY IN 20% TEST CONCENTRATION.

01900214 sampled: 09/25/90 LC50: 64.9 %
95% fid. limits: 52.5 - 80.2 %
comments: MISA Audit

06901697 sampled: 10/17/90 LC50: 33.0 %
95% fid. limits: 26.8 - 40.4 %
comments: 20% MORTALITY IN 30% TEST CONCENTRATION.

06901901 sampled: 11/14/90 LC50: 14.1 %
95% fid. limits: 10.0 - 20.0 %
comments: 100% MORTALITY IN THE 20% CONCENTRATION

06902130 sampled: 12/11/90 LC50: 14.1 %
95% fid. limits: 10.0 - 20.0 %
comments: COMPLETE MORTALITY IN 20% TEST CONCENTRATION

COMPANY: St. Marys Paper Inc., Sault Ste. Marie (860304)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Clear To River effluent collected between July and December 1990 were provided by St. Mary's Paper Inc., Sault Ste. Marie. The samples were lethal, and the LC50s ranged from 22.4 to 48.5 % effluent. A Ministry audit sample in September was LC50 > 100 % effluent.

Clear to River

06900961 sampled: 07/18/90 LC50: 48.5 %
95% fid. limits: 39.6 - 58.0 % slope: 7.0
comments: 50% MORTALITY IN 50% TEST CONCENTRATION

06901168 sampled: 08/15/90 LC50: 30.8 %
95% fid. limits: 26.6 - 35.6 %
comments: 50% MORTALITY IN 30% TEST CONCENTRATION.

06901415 sampled: 09/12/90 LC50: 39.4 %
95% fid. limits: 32.1 - 48.3 %
comments: 20% MORTALITY IN 30% TEST CONCENTRATION.

02900214 sampled: 09/25/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Low D.O.

06901698 sampled: 10/17/90 LC50: 37.0 %
95% fid. limits: 33.9 - 40.4 %
comments: COMPLETE MORTALITY IN 50% TEST CONCENTRATION.

06901902 sampled: 11/14/90 LC50: 33.0 %
95% fid. limits: 26.8 - 40.4 %
comments: 20% MORTALITY IN THE 30% CONCENTRATION

06902131 sampled: 12/11/90 LC50: 22.4 %
95% fid. limits: 17.1 - 28.2 %
comments: 20% MORTALITY IN 20% TEST CONCENTRATION.

COMPANY: Trent Valley, Trenton
(1750009)
(now with Paperboard Mills Division)
SECTOR: pulp and paper
REGION: Southeast

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Process Effluent collected between July and December 1990 were provided by Trent Valley, Trenton. Two samples were non-lethal, and two samples were LC50 > 100 % effluent. Two samples were lethal, and the LC50s were 80.7 and 80.6 % effluent.

Process Effluent

06900898 sampled: 07/10/90 LC50: 80.7 %
95% fid. limits: 70.0 - 94.0 % slope: 13.9
comments: 90% MORTALITY IN FULL STRENGTH EFFLUENT

06901217 sampled: 08/21/90 LC50: 80.6 %
95% fid. limits: 65.0 - 100.0 %
comments: COMPLETE MORTALITY IN FULL STRENGTH EFFLUENT

06901408 sampled: 09/11/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 30% MORTALITY IN FULL STRENGTH EFFLUENT.

06901593 sampled: 10/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06901890 sampled: 11/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06902126 sampled: 12/11/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN 50,65, & 100% CONCENTRATIONS

Emergency Overflow E1

Intake Water

COMPANY: Trent Valley, Trenton
(1750009)
(now with Paperboard Mills Division)
SECTOR: pulp and paper
REGION: Southeast

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Process Effluent collected between July and December 1990 were provided by Trent Valley, Trenton. Three samples were non-lethal, and two samples were LC50 > 100 % effluent. One sample was lethal, and the LC50 was 70.2 % effluent.

Process Effluent

06900897 sampled: 07/10/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 30% MORTALITY IN FULL STRENGTH EFFLUENT.

06901218 sampled: 08/21/90 LC50: 70.2 %
95% fid. limits: 63.0 - 78.1 %
comments: 40% MORTALITY IN 65% TEST CONCENTRATION

06901409 sampled: 09/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06901594 sampled: 10/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 20% MORTALITY IN FULL STRENGTH EFFLUENT.

06901891 sampled: 11/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED

06902127 sampled: 12/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Emergency Overflow E1

Intake Water